THE MAILING LIST

The Infantry School

MAILING LIST

A compilation of instructional matter prepared at The Infantry School and issued from time to time

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PREFACE

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CHAPTER 1

Protection of Motor Tactical Movements

(AN INFANTRY SCHOOL TEACHING)

20Oct39

In this modern age of motorization, the tactical movement of troops by motors is becoming a subject of increasing importance. The present trend is to replace animals by motors in infantry units. Sufficient motor transportation is not allotted to an infantry unit to move its foot troops by motor but the amount of additional motor transportation required to transport the entire unit is reduced. It is believed that many infantry troop movements of 600 miles or less that were formerly made by rail will now be made entirely by truck. The planning and execution of motorized troop movements under modern conditions present varied problems, many of which have not yet been satisfactorily solved. One of the most important of these problems is the protection of such tactical motorized troop movements as are in danger of being interfered with by hostile ground and air forces. It is the purpose of this chapter to consider methods and means by which this protection may be secured.

TRANSPORTATION REQUIRED

The number of trucks available for the movement of a command may have an important bearing on the means adopted for the protection of the movement.

Certain infantry organizations are provided with sufficient organic motors to move both personnel and equipment. The number of trucks required to move the infantry foot elements depends on the distance the unit is to be moved. For movements up to 50 miles, requirements are based on 15 men per

1½-ton truck and 25 men per 2½-ton truck. For movements in excess of 50 miles, requirements are based upon 13 men per 1½-ton truck and 20 men per 2½-ton truck.

Whenever insufficient trucks are allotted for the transportation of the foot troops of the command, it may be possible to employ organic motors for the movement of these foot troops. When such a measure is resorted to, it should be the motors of the supply train that are employed for the transportation of foot troops, rather than the tactical motors, since the tactical motors are essential to the initiation of combat. The supply train is not sufficient to transport all foot troops at one time, but by shuttling these motors the movement may be accomplished.

TYPES OF MOVEMENTS POSSIBLE

Tactical movements of troops by motors will probably fall under the following general classifications:

(1) The movement of reserves.

(2) The reinforcement of troops already engaged either on the front or on the flanks.

(3) The movement of an enveloping force.

(4) The movement of an encircling force during a pursuit.

(5) The movement of covering forces.

(6) The movement of a maneuvering force in passing from the defensive to the offensive.

(7) The movement of troops to exploit a success.

These movements will either be covered by troops that are already in position on the front, or they will be into an area which is not already controlled by our own troops.

VULNERABILITY AND TYPES OF EXPECTED ATTACKS

A motorized troop movement is particularly vulnerable to air attacks and to attacks by mechanized forces, because it is restricted to movement on roads. It can logically be expected that the enemy will employ all means available to block, delay, or defeat a troop movement which constitutes

a threat to him. Based upon information furnished by his distant air and ground reconnaissance, he may launch attacks from the air and on the ground by mechanized and motorized elements in an attempt to break up the troop movement.

An attack from the air might take one of two forms—either attacks against the moving column by low-flying aircraft; or the destruction of bridges by bombing operations in the path of the approaching troop movement, and then, when the column has halted on the road, launching an attack from the air.

Mechanized forces, operating from a convenient locality in conjunction with close air or ground reconnaissance, might launch one or more simultaneous or successive attacks, from favorable terrain, on the head and flanks of the marching column. Attacks by motorized forces consisting principally of infantry and truck-drawn artillery, augmented by mechanized vehicles, might also be made against motorized columns. It is probable that such a force would either occupy a key terrain feature across the route of approach with a view to blocking the heads of the columns, or occupy a terrain feature that would flank the line of march.

A defender may be expected to employ delaying detachments consisting of motorized infantry, mechanized cavalry or horse cavalry, to prevent or delay a motor movement around his flanks or to defend key terrain which would prevent such a movement. One may expect that any motor movement around an enemy flank within a distance of ten or fifteen miles of the hostile main force may be interfered with by small delaying detachments. These may be sent out to fight in position or to delay in successive positions. Such detachments can best operate from flank positions, allowing the passage of the advance guard or advanced mechanized elements and then attacking the main body by fire. These delaying detachments are particularly effective at night and serious delay to the column may be the result. Therefore, alternate routes should be chosen and reconnoitered and all commanders should be familiar with the plan to move such

units as are not engaged to the destination by the alternate routes.

In order to protect such a motor movement of an enveloping force around a hostile flank, the route should be reconnoitered by day and small detachments should be posted on key terrain features along the route and on roads leading from the hostile position. These detachments may prevent the enemy reaching suitable delaying positions.

PROTECTION—GENERAL

Under the assumption that the enemy will attempt to interrupt a threatening motor movement by one of the methods discussed, let us now consider what means of protection we must employ in order to protect the movement. Antiaircraft and antimechanized measures may be classified as either active or passive. Active measures are those which are intended to destroy or disable hostile airplanes or mechanized vehicles. Passive measures are those taken for the purpose of negating or minimizing the effects of hostile air and mechanized operations by other than retaliatory means. Passive measures which may be employed for antiaircraft defense are in general effective for antimechanized defense.

The measures taken for the protection of a tactical motor movement may fall under the following headings:

(1) Distant air reconnaissance.

(2) Distant ground reconnaissance.

(3) Distant security by cavalry and motorized detachments.

(4) Close air reconnaissance.

(5) Advance, flank, and rear guards.

(6) Dispositions within the column for close-in protection.

(7) Passive measures such as increased distances between trucks, high speed, selection of routes, alternate routes, detours, and movement through wooded areas.

(8) Control is of such importance that it also might be classed as a protective measure and one airplane might be employed profitably for this purpose.

Normally, a troop movement by motor should not be attempted except when the area into which the movement is to be made has already been secured, or when sufficient mechanized vehicles are available to permit the employment of mechanized security detachments capable of sweeping aside any minor resistance encountered. Exceptionally, reconnaissance reports indicating that a particular area is free from hostile troops may justify an effort to move into the area by motor. When movements which are threatening to the enemy are made, it may be expected that the enemy will endeavor to intercept the movement promptly. Consequently, even though the information from reconnaissance agencies indicates definitely that no hostile troops are present in the desired detrucking area, it does not follow that a motor movement thereto can be made without meeting resistance.

PROTECTION OF A MOTORIZED TROOP MOVEMENT INTO AN AREA THAT IS SECURE FROM GROUND ATTACK

Except for the possible intervention of strong hostile aviation, a motor movement into an area that is covered by friendly troops in sufficient strength to prevent a hostile mechanized breakthrough presents little difficulty. In this case no distant reconnaissance or security is necessary and only local security detachments need be furnished for the immediate protection of the motor columns in order to prevent surprise.

Antiaircraft protection must be provided for and suitable dispositions should be made to minimize the losses from hostile air attacks. In case the distance to be moved is relatively short and the necessity for the movement great, the trucks will normally take the most direct route and move at high speed. When time permits or secrecy is essential the route should be selected that affords the most concealment to a moving truck column. A road with frequent curves, devoid of long straight stretches is better than a relatively straight road. Where routes and alternate routes

are available through woods, movement with extended truck distances and at high speed may afford sufficient protection to permit the movement to be made by day when the urgency of the situation requires a daylight movement. Where sufficient time is available, such a movement would probably be made under cover of darkness.

PROTECTION OF A MOTORIZED TROOP MOVEMENT INTO AN AREA WHERE THERE IS A POSSIBILITY OF HOSTILE GROUND INTERFERENCE

In this case the troops in position are not of sufficient strength to prevent a hostile mechanized breakthrough. Therefore, it is necessary to take precautions to secure the safety of the motor columns. These precautions are:

(1) *Distant air and ground reconnaissance and distant security.*—In this case the troops in position furnish the distant air and ground reconnaissance and distant security for the motor columns. Close liaison must be maintained between the motor columns and the covering force.

(2) *Close air reconnaissance and control.*—Since the troops in position would have given advance information of any hostile troop movements into the area, there is little necessity for close air reconnaissance. When available, however, an airplane could be profitably employed for close reconnaissance and control of the columns.

(3) *Advance, flank, and rear guards.*—Advance guards should be of such strength and composition and should operate at such distances from the main columns that they will be able to seize a defensive line to secure a detrucking area for the main body or to form a covering force so that the main body may be routed around the locality where resistance is encountered. Flank and rear guards should be habitually employed in order to prevent surprise.

(4) *Dispositions within the columns.*—Suitable dispositions should be made within the columns to furnish close-in protection against a possible mechanized threat. Such dispositions should make the maximum use of dispersion consistent with the other requirements of the situation. This

would include not only increased distances between units of the column but also between vehicles. Available antitank units are distributed along the column. With multiple columns, the distribution of antitank units throughout each column gives a distribution of these weapons in depth, no matter from what direction the attack comes.

One of the most effective antitank weapons in our army today is light artillery. When contact with the hostile main forces is not imminent, a part of the motorized light artillery may be available for antimechanized missions. With contact imminent, the employment of light artillery on antimechanized missions will affect seriously its ability to perform other missions. Responsible commanders must decide the relative requirements of the antitank and other missions. While it is desirable that artillery march by regiment or battalion, it may sometimes be advisable to dispose light artillery by battery between units of other arms in situations where hostile mechanized attack in flank is probable. Antiaircraft artillery likewise affords antitank protection. The caliber 0.50 antiaircraft artillery machine guns can fire against mechanized vehicles, either from their truck mounts or from positions on the ground. Some models of antiaircraft cannon are incapable of firing at low elevations, but it is contemplated that in the future all guns will be designed to fire at moving targets on the ground.

(5) *Antiaircraft measures.*—Suitable active and passive measures should be taken to minimize effects of hostile attacks. Entrucking troops base their own protection against low-flying aircraft principally on passive measures. As meager a target as possible is presented for as short a time as possible. Nevertheless, the maximum fire possible is directed at attacking planes. Machine guns must be mounted for antiaircraft fire. Motorized machine-gun units (infantry or antiaircraft artillery) may be distributed throughout the entrucked troop column. Rifles and automatic rifles should be carried available and ready to fire, particularly by men on the sides and ends of the truck. Generally, unless there is reason to the contrary, vehicles move individually at varying

distances from a few yards to several hundred yards, and at the fastest practicable speed.

During daylight movements distances between trucks should be from 100 to 300 yards, and a running speed of 35 to 40 miles per hour should be maintained when possible.

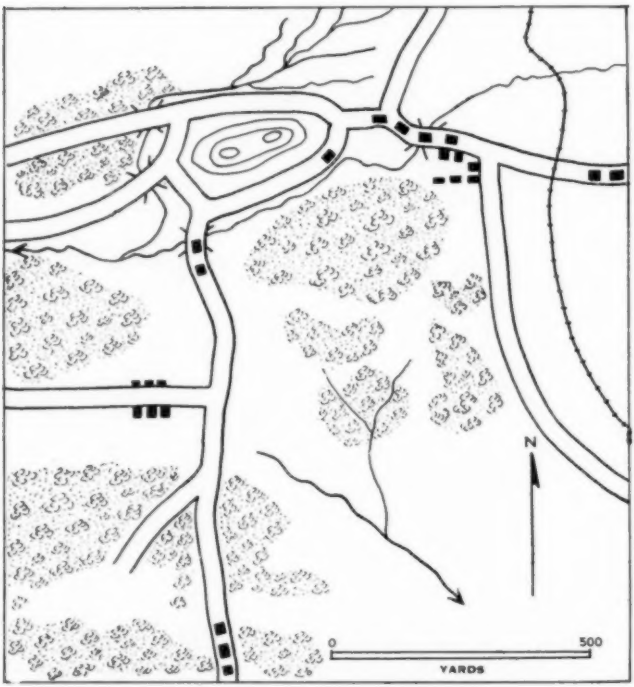

FIGURE 1.—Trucks on road at 150-yard distance shown to scale.

Massing of troops and transportation and the lining up of trucks in column are kept to the minimum at entrucking and detrucking points. Parts A and B of Figure 3 show the same number of trucks. In Part A the trucks have been halted in a single column on one road and with short distances between trucks. The troops have been marched in column

alongside the vehicles to entruck, thus forming a crowded mass and making an ideal target for hostile attack planes. In Part B the same number of trucks have been placed along the same length of the road, but by using side roads, lanes, and driveways, the formation is not crowded. Troops

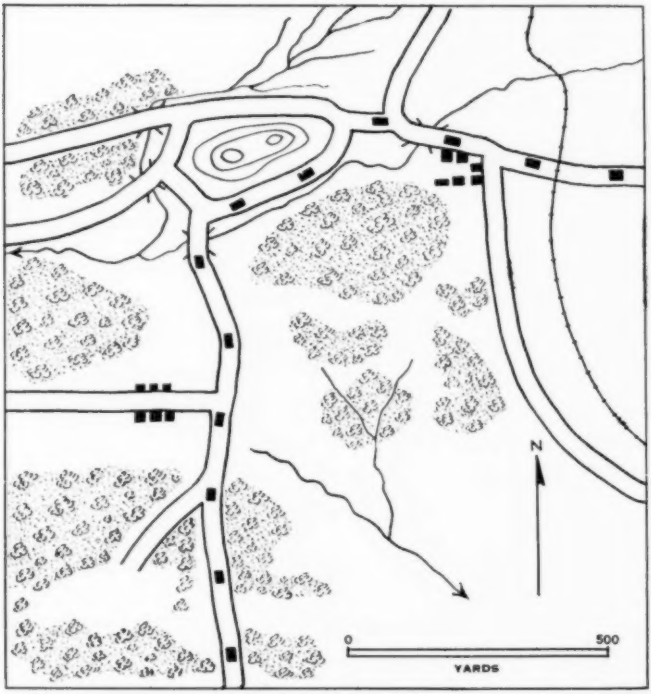

FIGURE 2.—Trucks moving at irregular distances shown to scale.

can approach the trucks in small columns from off the road, thus remaining in a deployed formation which would be less vulnerable to air attack. Dispersion at detrucking points can be secured by using the same general plan.

At the entrucking and detrucking points an area machine-gun defense should be established. Every effort must

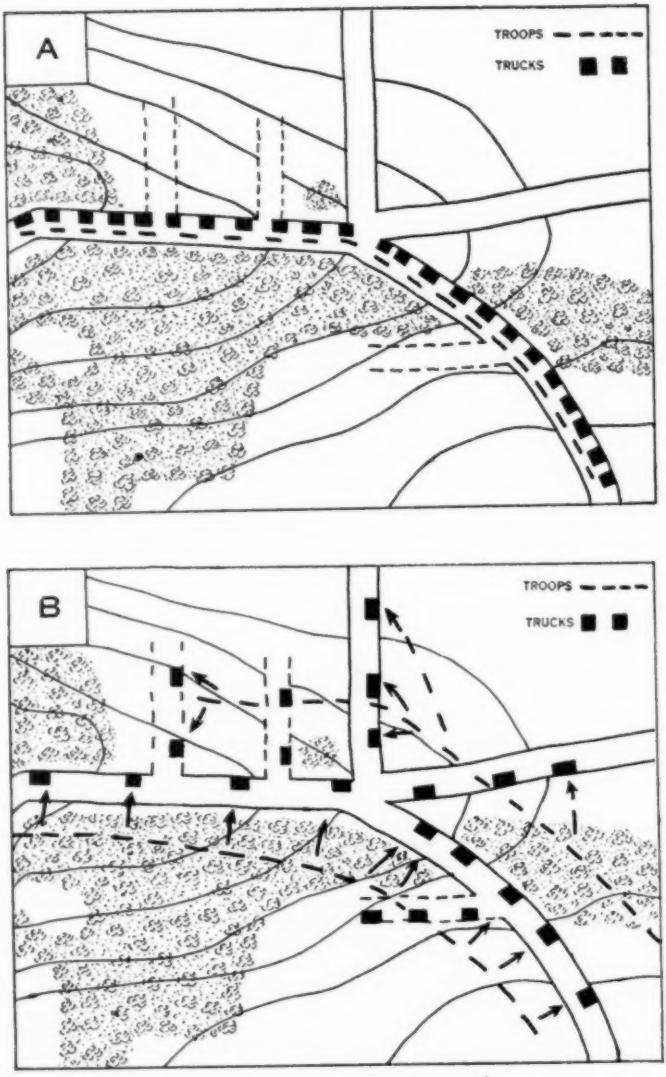

FIGURE 3.—Securing dispersion of troops at entrucking point.

be made to avoid traffic jams, or the closing up of trucks when halted. When attacked while moving on the road by day, trucks halt along the side of the road. In some cases trucks may be able to leave the road. If time permits, the troops jump out and seek near-by cover and open fire on the attacking planes. Otherwise they remain on the trucks and open fire. Machine guns mounted on the trucks open fire immediately. Trucks move rapidly on to their objective as soon as the attack is over. When attacked at night, such attacks usually being in the nature of harrassment by single planes, greater protection may be secured by keeping in motion, particularly on dark nights or on roads that are not well defined to air observation.

(6) *Movement by day or night.*—Since greater secrecy is afforded by movement under cover of darkness and since the probability and effects of hostile mechanized and air attacks are minimized during darkness, a night movement under these conditions usually would appear to give greater chances of success. The routes should be reconnoitered whenever possible just prior to darkness and a last minute reconnaissance report should be received by the commander of the motor movement. Night reconnaissance by motors can report only that the roads and villages are free of the enemy. This information, when our movement is protected by a covering force in position, might be sufficient information to justify a decision to initiate or to continue the motor movement.

MOTOR TROOP MOVEMENT INTO AN AREA NOT CONTROLLED BY FRIENDLY TROOPS IN POSITION

The speed and length of our movement, together with the capacity of the enemy to maneuver mobile troops against such a movement, will determine the distance to which distant air reconnaissance should be conducted. A fair measure of distance would be to reconnoiter at least one hour's march (30 miles) beyond our distant ground reconnaissance. Distant air reconnaissance should cover

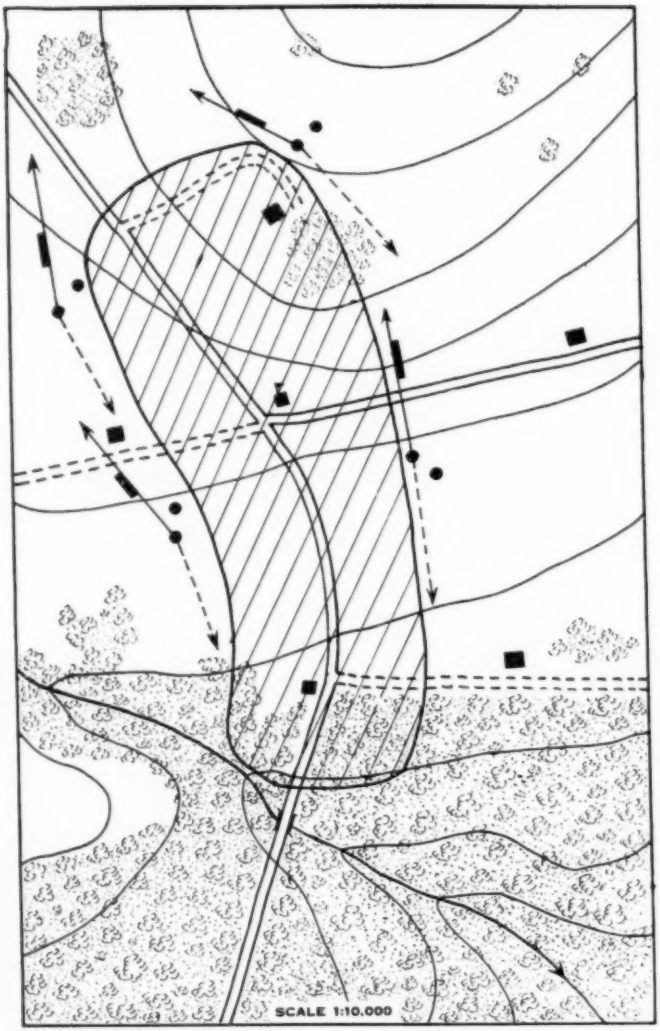

FIGURE 4.—Area machine-gun defense.

the flanks to the same distance as to the front. At least one airplane should be kept on reconnaissance at all times during the movement. After dark, air reconnaissance is effective only along main highways.

Distant ground reconnaissance, to be effective, should operate at sufficient distance to give advance information to the advance security detachment of hostile resistance encountered or of the approach of a hostile mobile force. This distant reconnaissance would operate at least one hour's march (20 to 30 miles) ahead of the advance security detachment. When available, scout and armored cars are particularly suited for this mission. When these are not available, a motorized detachment composed mostly of light vehicles for reconnaissance patrolling may be substituted. Radio communication with the distant reconnaissance units is highly desirable. At night these patrols can report only that the roads and villages are free of the enemy. This negative information, together with negative information from the distant air reconnaissance, may justify a night motor movement at considerable distance from the enemy.

Distant security is furnished by a covering force that moves so as to interpose itself between any hostile threat and our main columns. Due to the speed with which a hostile mechanized force may move to intercept our motor movement, it is essential that such a force be intercepted at considerable distance from our main columns. The covering force should operate 20 to 30 miles in advance of the local advance guards of the main columns. The composition of this force should be such that it is capable of meeting and stopping a mechanized threat. Mechanized cavalry is particularly suitable for this mission. The distant reconnaissance is usually controlled by the commander of the distant security detachment. When mechanized cavalry is available, it may be assigned the mission of covering the motor movement, as advance cavalry, in which case it furnishes the distant reconnaissance and the distant security. When no cavalry is available, motorized detachments strong in antitank weapons might be used for the distant

security detachment although they are not as desirable as mechanized cavalry.

In addition to the distant air reconnaissance, close air reconnaissance should be maintained to cover the route. An airplane should reconnoiter intercepting flank roads and cooperate with the distant security detachments. It may be possible to employ this close reconnaissance airplane on control or command missions. Its close air reconnaissance mission, however, should be given first priority.

The main body habitually employs advance, flank, and rear guards for the immediate protection of the main columns. These security detachments are organized from the troops and vehicles of the column. Their strength and composition will of course vary with the mission, the situation, and the terrain. These security forces must have antitank units to cope with the enemy's reconnaissance and security groups which they are likely to meet. An attack in force by mechanized units can be met only by the combined defense formations of the main body, and here the role of reconnaissance and security agencies is to give timely warning and gain time for the main columns to prepare to receive the attack. Under the conditions of modern mobility, the front, flanks and rear of the main columns in effect disappear, and security becomes a perimeter obligation. Distances of these security elements from the main body should be computed in units of time rather than in units of distance. Communication, which will enable the reconnaissance and security agencies to transmit warnings of mechanized threats with rapidity and security to the main body, is essential.

Suitable antitank weapons should be disposed within the main columns to meet a mechanized attack that might break through or evade our security detachments. Such weapons would include those of organic antitank units, attached antitank units, light artillery disposed for antitank defense, or antiaircraft machine guns which may be used against tanks as well as airplanes.

Passive measures, such as increased distance, high speed, selection of routes and alternate routes as have been

previously discussed will minimize the effects of hostile air attacks.

At times the control of such a troop movement will be of such importance that one command airplane would be used exclusively for control.

Small hostile delaying detachments, operating at night, may seriously delay any motor movement. Therefore, the commander, before deciding whether to march by day or night, must consider the capacity of the enemy to interpose small delaying detachments along the route of march. When the movement is at a considerable distance from the enemy main body and the distant air and ground reconnaissance have reported the route clear just prior to darkness, a night movement at reduced speed and without lights may be justified for purposes of secrecy. No set rule can be given to determine whether a day or night march should be made. During a daylight movement with a strong possibility of hostile air attack, increased truck distances must be employed in addition to other passive and active antiaircraft measures.

SELECTION OF ROUTES

Security may often be provided by selecting routes that are protected by natural barriers such as impassable rivers and mountain ranges. A stream or a mountain range that will limit the approach of hostile mechanized vehicles to certain roads will simplify the protection of a flank. In such a case the flank may be protected by the establishment of protected road blocks and by demolitions. When the road net permits, alternate routes, which can be used in case the enemy blocks the main route, should be selected and reconnoitered. Circuitous routes over secondary roads through closely wooded terrain may be considered advisable in order to avoid hostile detection and air attacks.

MAIN BODY

The roads available, the hostile air situation, the size of the command, the necessity for control, and the enemy

situation are the governing factors in determining the number of columns to be used. Due to the speed of movement and the comparatively short time-lengths of motor columns, such movements will usually be made by the employment of fewer columns than for a movement on foot.

The employment of the troops during or at the completion of the march governs the order of march. When it is expected that the troops will engage in combat during or at the conclusion of the march, each column should be composed of a suitable combat team. In the case of a large command moving in a single column, an infantry regiment with its supporting arms should lead the column.

In addition to the security detachments, the main body must be prepared for immediate close-in protection by the proper distribution and disposition of weapons within the column as heretofore discussed.

When the movement is made in several columns and it is necessary to coordinate and control the advance, the movement should be made by bounds from one coordinating line to the next, advancing from each line on a time schedule or by order. The commander will normally march at the head of the main body of a single column. When there are a number of columns, he will usually march at the head of the main body of one of the several columns and employ radio and possibly an observation airplane for communication with his various columns and security detachments. The possibility of commanding such a troop movement from the air must not be overlooked.

SUMMARY

A highly mobile force of all arms will consist primarily of motorized elements. The large proportion of these will consist of infantry transported in trucks and truck-drawn artillery. Such a force can move with comparatively great rapidity, and can cover long distances in short periods of time. This force, particularly the infantry part of it, will not be in as high a degree of readiness for combat or antimechanized defense during the motor movement as it would

be if moving on foot. Increased distances between vehicles are required for operation at high speeds and for antiaircraft defense; this makes long columns. Information regarding the situation over a considerable area will be required, and measures for protection must be as complete and effective as possible. Generally speaking, such a force will not be able to move freely through an area which is not controlled by friendly forces, unless serious hostile interference is improbable. Normally, security will be provided by covering forces sent into or already established in the area. Motorized detachments or friendly mechanized forces, whose rate of movement is at least that of the main body, must be employed as advance, flank, and rear guards to secure the main body against attack by hostile mechanized forces, or other kinds of fast-moving attack. The same general methods are employed in protecting highly mobile columns against mechanized attack as are used in defense of slow-moving columns, the principal difference being that increased distances and speeds and greater areas are usually involved.

The formations, dispositions, security, and active and passive measures adapted for defense of marching columns against mechanized vehicles need no alteration to meet air attacks other than provision for the delivery of antiaircraft fire.

In principle, whether considering defense of marching columns against aviation or mechanization, counter measures must be based upon—

(1) The defeat or delay of the enemy at a distance. In the case of defense against air attack, this may be accomplished by offensive operations of friendly air forces. Hostile mechanized forces may be delayed by friendly mechanized, or other security forces, and by defended obstacles and demolitions at defiles on routes leading into the area of march.

(2) The matching of speed with speed by the maximum practicable use of mechanical transport in troop movements.

(3) The gaining of timely information of the enemy by

reconnaissance and security agencies and preparing to meet all possible forms of attack. Reconnaissance for security must generally be maintained in all directions and at distances appropriate to modern mobility.

(4) An effective use of dispersion and concealment, including movements under cover of darkness, consistent with other requirements in the situation.

(5) The best use of the available routes and terrain, both for concealment and protective cover for truck columns and as obstacles to hostile operations.

(6) The concentration of the maximum possible firepower from suitable weapons at every favorable opportunity.

CHAPTER 2

Protecting a Brigade Motor Movement

(INFANTRY SCHOOL TEACHING)

20 Oct 39

ILLUSTRATIVE PROBLEM

The situations in this problem have been designed to bring out the following essential items:

1. The plan of the brigade commander to carry out his mission.
2. The formation of a motorized detachment to provide for both distant reconnaissance and advance security for the motor movement.
3. The employment of observation aviation for distant and close air reconnaissance.
4. The use of advance and flank guards to provide close-in security for the main body of the motor movement.
5. The employment of engineers with the motorized detachment and with the flank guards of the main body.
6. The antiaircraft and antitank protection required for the movement.

In this problem the 1st Brigade is reinforced by the following units:

Each infantry regiment has one additional company called the Antitank Company consisting of three platoons, each armed with four antitank guns.

Company A 1st Antimechanized Battalion (three platoons, each with three antitank guns).

2d Field Artillery (75-mm guns truck-drawn) (less 1st Battalion) (three firing batteries, each with four guns).

1st Battalion 3d Field Artillery (155-mm howitzers, truck-drawn) (two firing batteries, each with four guns).

Provisional Battalion 104th Coast Artillery (AA) consisting of:

Battery B, with four 75-mm (AA) guns.

Batteries E and F—each with three platoons of four 0.50 caliber (AA) machine guns.

1st Battalion 1st Engineers consisting of two engineer companies.

Provisional Battalion 1st Quartermaster Regiment, reinforced, consisting of two truck companies, each with forty-eight 1½-ton trucks, reinforced by one extra platoon of twenty-four 1½-ton trucks.

Troop A 1st Armored Car Squadron, consisting of three platoons, each with four armored cars.

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1. *SITUATION.*—*a.* Maps: Harrisburg Area (see Figure 5), and sketches of critical terrain areas (see Figures 6, 7, 8, 9, and 10).

b. (1) The Susquehanna River forms the boundary between two states, Blue (northeast) and Red (southwest), between whom war is imminent.

(2) Treaty agreements do not permit troop garrisons, concentrations, or military works, within ten miles of the boundary between Red and Blue territory.

(3) Red has been concentrating in the Cumberland Valley and in the Baltimore—Washington area, 75 miles south of Harrisburg. Red is known to be deficient in motor transportation. Red has an attack squadron which is stationed normally near Washington. No information is available as to its readiness for combat or its present whereabouts. Red observation aviation, estimated at one flight of four airplanes, occupies a landing field just east of Shippensburg (ten miles southwest of Newville).

(4) Blue has been concentrating east of the line: Lebanon—Lancaster. Blue attack aviation will not be available for several days. Observation planes of the Blue I Corps have been observing in the Harrisburg area and are prepared to reconnoiter over the Cumberland Valley as soon as war is declared.

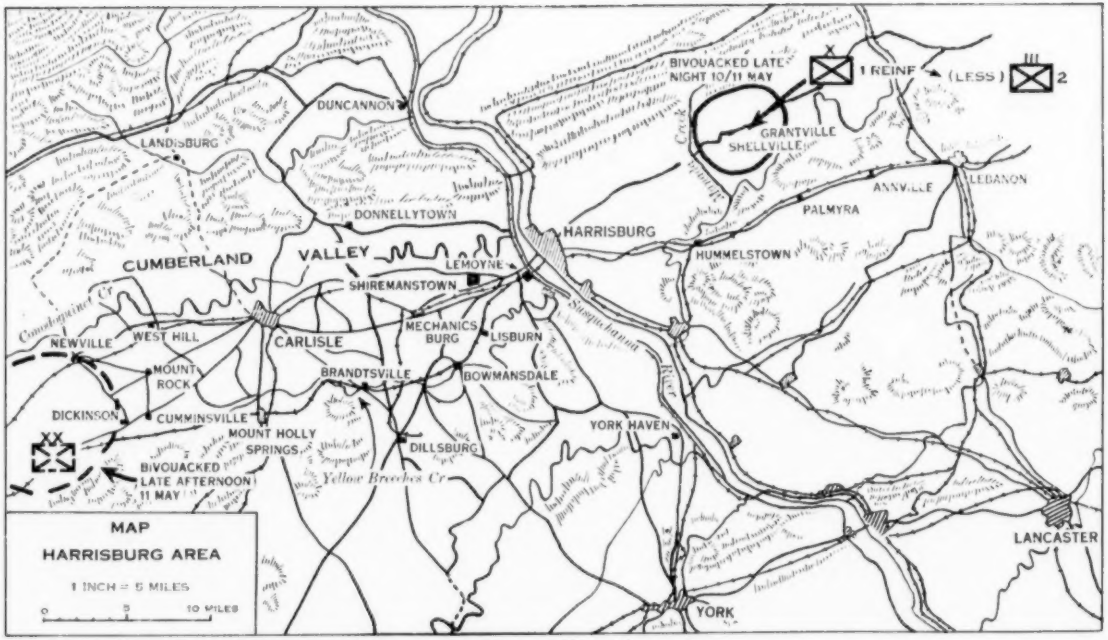


FIGURE 5.—Map of Harrisburg area.

c. Blue war plans provide, in part, for an invasion of Red territory by the I Corps at Lemoyne and operations by this corps to the southwest in the Cumberland Valley.

d. The Blue 1st Brigade, reinforced, (less 2d Infantry), after a night march from the east, went into concealed bivouacs the night 10 11 May in the Shellville area. The forward edge of the bivouac area is along Manada Creek.

e. Brigadier General 1st Brigade has received orders from the I Corps, extracts of which follow:

Immediately upon the declaration of war, the 1st Brigade (reinforced) will cross the Susquehanna River at Harrisburg and hold hostile ground forces west and south of the line: Mechanicsburg—Bowmansdale—Lisburn (see Figure 6), in order to protect the crossing of the Susquehanna River by the remainder of the I Corps at Harrisburg.

f. At 4:00 AM 12 May, Brigadier General 1st Brigade at Shellville received the following information by telephone from the Chief of Staff of the I Corps:

(1) War was declared by Red at 3:30 AM today.

(2) The 2d Infantry (less motors) will complete detraining at Hummelstown at 11:30 AM today. The motors of the 2d Infantry will arrive at Hummelstown at 12:00 noon today, prepared for immediate further movement.

(3) Troop A 1st Armored Car Squadron will arrive at Grantville at 4:20 AM today and is attached to the 1st Brigade.

(4) The remainder of the I Corps will begin crossing the Susquehanna River at Harrisburg at 1:00 AM 14 May.

(5) A Red force estimated as one division, which was advancing to the east by normal foot marches on 11 May, went into bivouac between Newville and Walnut Bottom late in the afternoon of 11 May.

g. At 4:10 AM a plane of the 901st Observation Squadron dropped a message which stated that at 4:00 AM foot troops were moving out of bivouacs south of Newville and were marching east in three columns with the heads of the columns at West Hill, Mount Rock, and Cummingsville. (See Figure 6.)

FIRST REQUIREMENT

2. The plan of Brigadier General 1st Brigade to carry out his mission, to include instructions for the 1st Infantry and such units as may be attached thereto.

A SOLUTION OF FIRST REQUIREMENT

3. Brigadier General 1st Brigade decided, in part, as follows:

a. To move the brigade at once across the Susquehanna River and gain contact with and delay the advance of the Red division, in order to hold the Reds west and south of the line: Mechanicsburg—Bowmansdale—Lisburn, until the remainder of the I Corps crosses the Susquehanna River.

b. To have the 1st Infantry, reinforced, move in quartermaster trucks at once, via Harrisburg and Mechanicsburg, toward Carlisle and gain contact with and delay the advance of hostile troops. Reinforcing units: Troop A 1st Armored Car Squadron, 2d Field Artillery (less 1st Battalion) with 1st Battalion 3d Field Artillery attached, Company A 1st Engineers, Company A 1st Antimechanized Battalion and the Provisional Battalion 1st Quartermaster Regiment, reinforced, all to be attached to the 1st Infantry.

DISCUSSION OF FIRST REQUIREMENT

4. *a.* The reinforced brigade is the covering force for the concentration of the I Corps. It has been given a definite mission, and, if it fails to hold hostile ground forces west and south of the line prescribed by the I Corps for the specified time, the Reds will be able to interdict the bridges at Lemoyne with artillery fire. This would interfere seriously with the crossing of the I Corps.

b. The method of accomplishing the prescribed mission is a responsibility of the 1st Brigade commander. The situation is such that if both Red and Blue proceed by marching on foot, Red is capable of reaching the line prescribed by the I Corps prior to the arrival of Blue. Therefore, the 1st Brigade commander decides to make use of truck transportation. Trucks are available to the 1st Brigade in the Provisional Battalion 1st Quartermaster Regiment, reinforced.

c. Having decided to move at once by truck; can the brigade occupy the line prescribed by the I Corps prior to the arrival of the Red division? If the 1st Infantry is moved at once by truck, its rear elements can arrive on the prescribed line by 6:00 AM today. If the 2d Infantry moves by truck at 12:00 noon today, its rear elements can arrive in the area south of Shiremanstown by 1:00 PM. The 1st Infantry in trucks, Troop A 1st Armored Car Squadron, and the truck-drawn artillery can arrive in time to effect an organization of the position and be prepared to meet the Red division whose leading elements may reach the position by 1:00 PM today. If Blue defends on the line prescribed by corps, then Red is capable of a piecemeal attack against the hastily prepared position by 3:00 PM today, or a coordinated attack late in the afternoon. To fulfill its mission, the 1st Brigade would be required to hold the bridgehead position throughout the afternoon and night of the 12th and the day and night of the 13th. Against the Red division, it seems highly improbable that the 1st Brigade can accomplish this, and another plan is indicated. A plan that will prevent Red from attacking the bridgehead position until late in the morning of the 13th will afford Blue a better chance of success. This immediately suggests a delaying action in front of that position.

d. Troops of sufficient mobility and power are available to the 1st Brigade commander with which to delay the Newville Reds. There are two delaying positions in the vicinity of Carlisle. The armored car troop should be able to make an early reconnaissance, and cover the advance of the remainder of the delaying force. In case the armored car troop is held up by hostile armored cars or mechanized forces, it can be reinforced by the antimechanized company, truck-drawn artillery, and infantry in trucks. If the Newville Reds are held west of Stony Ridge until 2:00 PM today, they will be unable to reach the outposts of the bridgehead position until near dark on the 12th. Furthermore, this will provide time in which to prepare the bridgehead position for defense.

c. Brigadier General 1st Brigade should be free to control the movement of the remaining elements of the brigade to the bridgehead position, and to supervise its organization for defense. He should also be free to coordinate the activities of the delaying force with those of the remainder of the brigade. Therefore, it is desirable that the delaying mission be assigned to the regimental commander of the 1st Infantry.

SPECIAL SITUATION (BLUE), CONTINUED

5. *a.* Part of the plan of Colonel 1st Infantry provides that a motorized detachment precede his column to provide distant security. The troops and transportation for the motorized detachment were bivouacked so as to be able to move on forty minutes' warning.

b. The main body of Colonel 1st Infantry's command will begin its march at 5:40 AM.

SECOND REQUIREMENT

6. *a*. The composition of the motorized detachment.

b. The mission assigned to the motorized detachment.

c. The plan for the employment of Troop A 1st Armored Car Squadron to include only the time of departure, and mission.

d. The phase lines designated by the commander of the motorized detachment and reasons therefor.

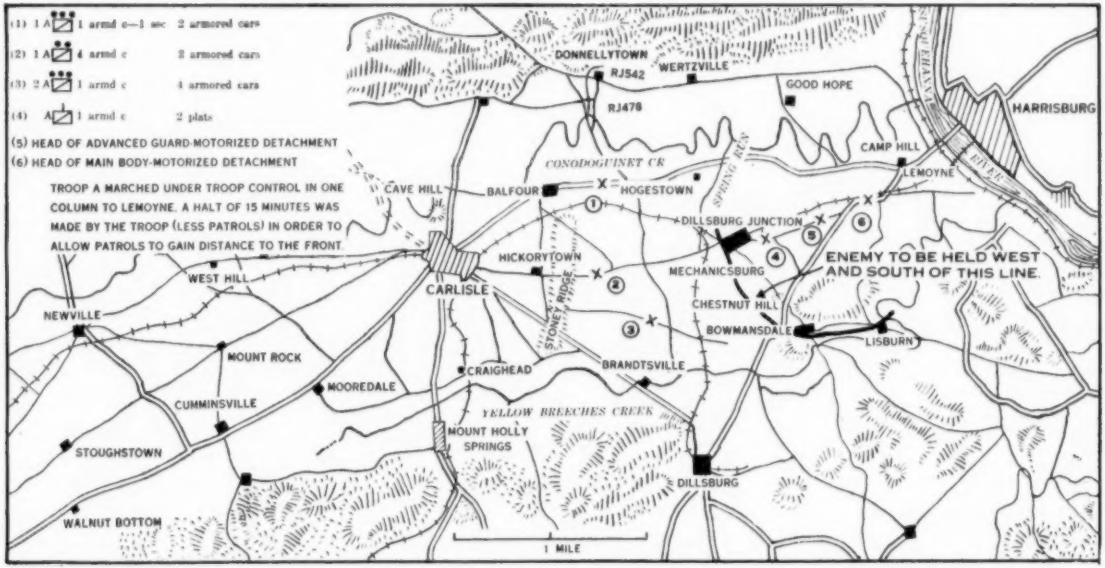


FIGURE 6.—Troop A 1st Armored Car Squadron at 5:30 AM.

A SOLUTION OF SECOND REQUIREMENT

7. *a.* The composition of the motorized detachment is as follows:

Lieutenant Colonel, Regimental Executive Officer, 1st Infantry, commanding

Headquarters Detachment from Headquarters Company 1st Infantry
Detachment Communication Platoon 1st Infantry
Troop A 1st Armored Car Squadron
Company A 1st Infantry
Company D (less 2d Section 2d Platoon) 1st Infantry
Company A 1st Antimechanized Battalion
Artillery reconnaissance detail
Engineers (see Fifth Requirement)
20 trucks, 1st Quartermaster Regiment.

b. March at 4:45 AM. Delay Red forces advancing within the zone: north boundary Conodoguinet Creek—south boundary Yellow Breeches Creek. Special attention to mechanized and motorized forces. Rate of march: 25 miles per hour.

c. To have Troop A 1st Armored Car Squadron leave Grantville at 4:40 AM, 12 May; thence gain and maintain contact with Red forces advancing within the zone: north boundary Conodoguinet Creek—south boundary Yellow Breeches Creek.

d. Phase lines designated by the commander of the motorized detachment:

1st phase line: Spring Run—Dillsburg Junction—Chestnut Hill.

2d phase line: Stony Ridge.

3d phase line: Cave Hill—eastern exits of Carlisle—Mount Holly Springs.

Reasons for the designation of phase lines.—The commander of the motorized detachment has been given a definite delaying mission. It is probable that he will be forced to delay in successive positions. In order to accomplish his mission he should select successive terrain features

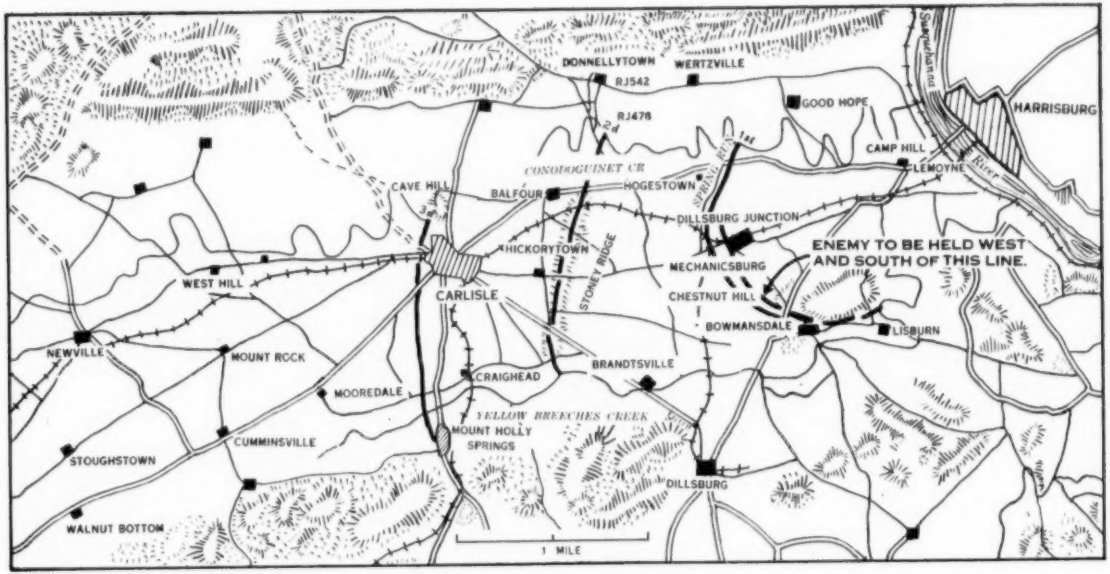


FIGURE 7.—Phase lines.

which, when occupied, will give him an advantage. These features are designated to the command as phase lines. When the armored car troop gains contact with advancing Reds the commander of the motorized detachment will probably dispose his command on the most advanced phase line obtainable.

DISCUSSION OF SECOND REQUIREMENT

8. The motorized detachment is to operate well in advance of the main column, hence, it is essential that it consist of all the elements which are necessary for temporary independent action. A senior officer of mature judgment, who by reason of his status as regimental executive is thoroughly familiar with the Colonel's plan, is placed in command of this composite detachment. Personnel from the regimental headquarters company is added to assist in maintaining liaison with reconnaissance elements and the main column. Troop A 1st Armored Car Squadron is included because it has the ability to gain contact rapidly and to maintain contact with hostile forces. A company of infantry, reinforced with caliber 0.30 machine guns, is capable of delaying, for a considerable period, any force which attempts to advance on roads from the west. Company A 1st Antimechanized Battalion is provided to protect the detachment from attacks by hostile mechanized units. An artillery reconnaissance detail is included to facilitate the employment of the field artillery should it be required. It would secure all the necessary preliminary information for the firing batteries prior to their arrival. Engineers are attached to facilitate the motor movement, gain early information of a technical nature, and assist the delaying or defensive action.

AIR SITUATION

9. *a.* No Red air activity has been observed.

b. The Blue I Corps has one squadron of 13 observation airplanes (the 901st) operating from a landing field just

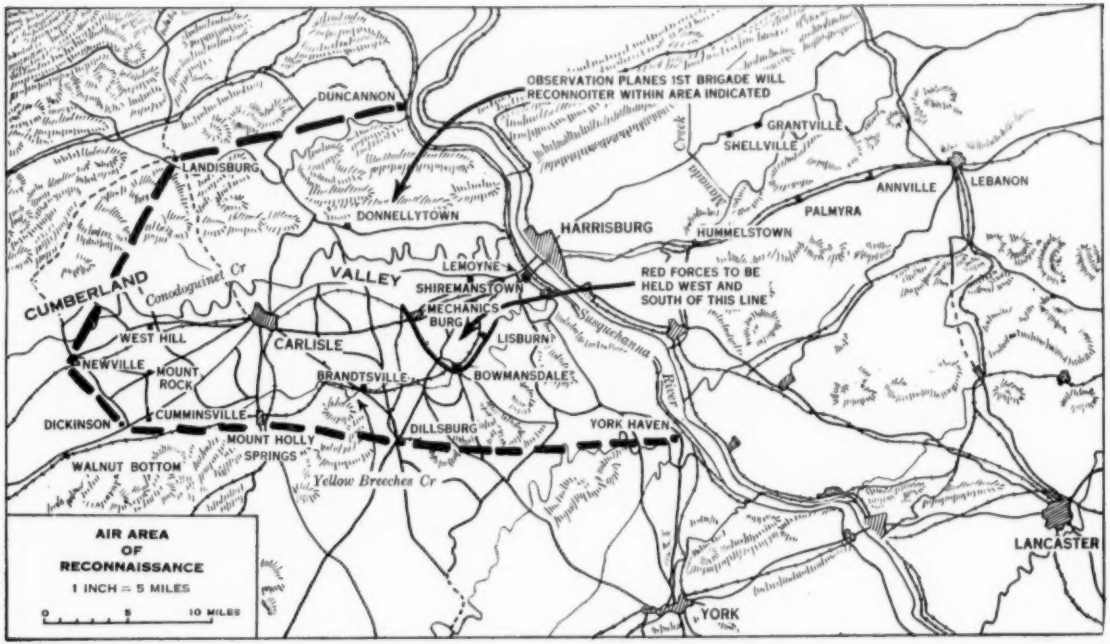


FIGURE 8.—Air area of reconnaissance.

east of Lebanon with an advanced landing field near the brigade command post. Telephone connection has been established between this field and 1st Brigade Headquarters.

c. Beginning at daylight, 12 May, three observation airplanes from the 901st Observation Squadron will be stationed at the advanced landing field to operate on call from the 1st Brigade.

d. The I Corps aviation will execute distant reconnaissance and maintain surveillance west of the Susquehanna River beyond the line: Duncannon—Landisburg—Newville—Dickinson—Mount Holly Springs—Dillsburg—Yorkhaven. Reports of Red movements and dispositions beyond this line will be furnsihed 1st Brigade Headquarters by dropped messages.

e. Captain Observer X reported at Brigade Headquarters at 6:00 PM, 11 May, as air liaison officer. Among other items he was furnished a copy of the essential elements of enemy information, which were as follows:

(1) Are the Harrisburg bridges intact?

(2) Will the enemy interfere with our crossing of the Susquehanna River? If so, how and with what forces.

(3) What is the march disposition, composition, and progress of the Newville Reds?

(4) Are there any other forces west of the Susquehanna River that can interfere with the advance? If so, when, with what forces, and from what direction?

(5) Are there any mechanized forces or combat aviation that can interfere with the motorized movement? (The Blue I Corps would be requested to obtain this information.)

f. As a result of conferences with the communication officers of the 1st Brigade and the 1st Infantry, arrangements were made for the plane-to-ground and ground-to-plane identification signals, dropping ground panels and methods of communication. Reports from air observers will be by radio to Troop A 1st Armored Car Squadron, and by dropped messages to the motorized detachment of the 1st Infantry and to the 1st Brigade.

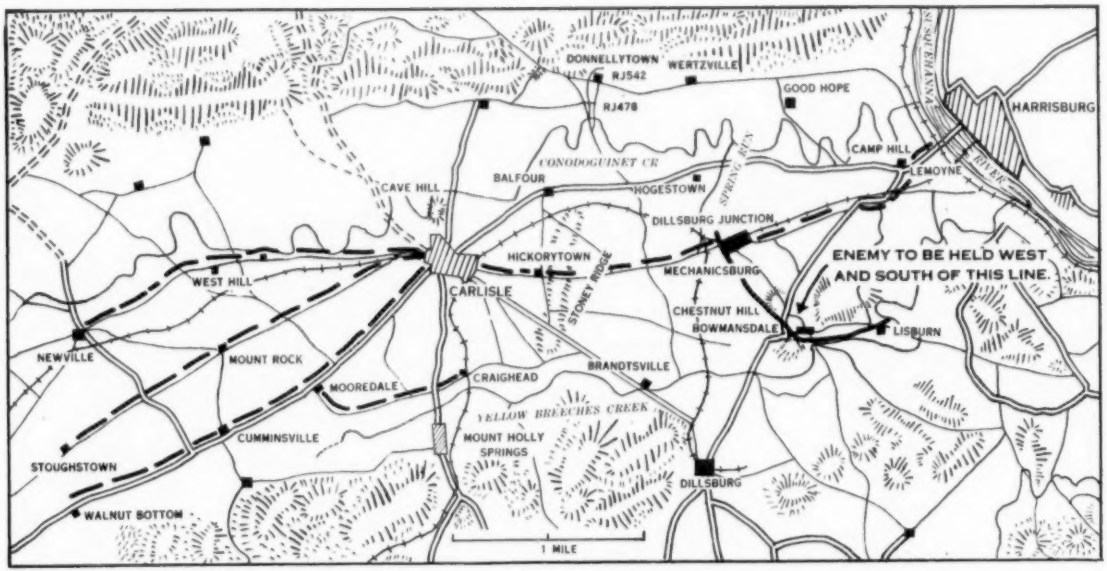


FIGURE 9.—Roads to be reconnoitered initially.

THIRD REQUIREMENT

10. The instructions issued to the air liaison officer by brigade headquarters covering the employment of the three observation airplanes made available to the 1st Brigade.

A SOLUTION OF THIRD REQUIREMENT

11. At 4:20 AM, the following instructions were issued to Captain Air Liaison Officer:

Beginning at once, and continuing until further orders, one observation airplane will execute continual reconnaissance within the assigned air area and, beginning at 6:00 AM, will report to the commander of the 1st Infantry the progress of the motorized detachment.

The following roads will be reconnoitered initially:

Lemoyne—Mechanicsburg—Carlisle—Newville.
Stoughstown—Carlisle.
Carlisle—Walnut Bottom.
Craighead—Mooredale.

Observe particularly for the following information:

Condition of Harrisburg bridges.
Presence, strength, and movement of any mechanized or motorized forces.
Composition, disposition, and progress of Red force reported moving east from the Newville area, or any other forces within the assigned air area.

The routes from the vicinity of Donnellytown and the crossings of Yellow Breeches Creek between Lisburn and Brandtsville will be observed at frequent intervals to insure against surprise attacks by hostile mechanized or motorized elements.

Information will be reported as soon as obtained to Troop A 1st Armored Car Squadron, with copy to Commanding Officer Motorized Detachment, and Commanding Officer 1st Infantry. Copies of all messages will be dropped at this headquarters every two hours beginning at 7:00 AM.

One of the three airplanes will be prepared to maintain the infantry mission as soon as contact is gained.

DISCUSSION OF THIRD REQUIREMENT

12. The employment of observation aviation in this situation is limited initially to reconnaissance missions in

order to obtain information of the enemy which will assist the efforts of Troop A 1st Armored Car Squadron, the motorized detachment, and the 1st Infantry. The orders given the pilot-observer team are based on the present enemy situation and the essential elements of enemy information. Corps has limited the air area of the brigade. Corps aviation executes distant reconnaissance beyond this area, thus enabling the aircraft working with the brigade to concentrate its reconnaissance over the area of immediate tactical importance to the brigade commander.

The observation team is given specific directions to reconnoiter certain roads, which are those over which the Newville Reds were reported advancing. The character of the information sought is also stated, as well as to whom and when reports will be submitted.

FOURTH REQUIREMENT

13. *a*. What should be the composition of the advance guard of the main body?

b. What should be the time interval between the advance guard of the main body and the main body? At what time should each begin its march?

c. What should be the composition of the flank guards or flank patrols, if any, for the protection of the main body, and what instructions should be issued to them?

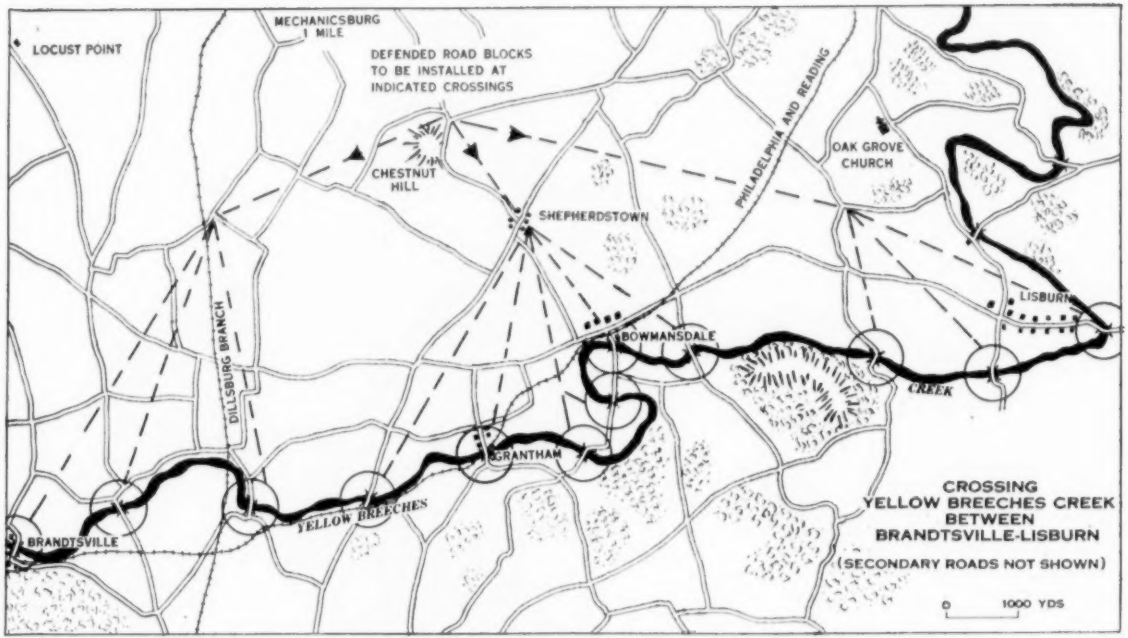


FIGURE 10.—Crossings of Yellow Breeches Creek.

A SOLUTION OF FOURTH REQUIREMENT

14. *a.* The advance guard for the main body consists of Company B 1st Infantry (less detachments), 1st Section 1st Platoon Antitank Company 1st Infantry, 2d Section 2d Platoon Company D 1st Infantry, engineer reconnaissance detail, reconnaissance and liaison detail from 2d Field Artillery, all under command of Major Executive Officer of the 1st Battalion 1st Infantry.

FIGURE 11.—Road blocked with contact mines. Photograph taken at 100 yards.

b. There should be a ten-minute time interval between the advance guard and the main body. The advance guard should march at 5:28 AM; the main body at 5:40 AM.

c. The 2d Platoon of Company B 1st Infantry, with six quartermaster trucks containing road block material (and engineers, see next requirement) attached, will follow the motorized detachment across the river. It will then move, by routes south of the Mechanicsburg and Harrisburg

road, to the vicinity of Bowmansdale and establish and defend road blocks at all crossings of Yellow Breeches Creek between Brandtsville and Lisburn, for the protection of the south flank. Units defending road blocks will remain in position until relieved.

Two squads of Company B in two quartermaster trucks with road block material (and engineers attached, see next

FIGURE 12.—Road blocked with contact mines. Photograph taken at 50 yards.

requirement) will follow the 2d Platoon of Company B across the river and move via Camp Hill, Goodhope, and Wertzville to the vicinity of Donnellytown. They will establish and defend road blocks at the stream crossings 400 yards west of RJ 478 and 400 yards west of RJ 542 for protection of the north flank. They will remain in position until relieved.

One patrol, from Company B, with two quartermaster trucks and one motorcycle and road block material, will follow the advance guard across the river and move via the road: Camp Hill—Hogestown—Balfour, and protect

the north flank. It will report to the main body by messenger at Mechanicsburg and Hickorytown.

SITUATION, CONTINUED

15. All roads shown on the map are passable for two-way motor vehicle traffic. The weather is dry.

In addition to its basic transportation, Company A 1st Engineers has attached to it ten engineer dump trucks. Of

FIGURE 13.—Road blocked with contact mines. Photograph taken at 10 yards.

these, one is loaded with 65 concertina rolls, five are fully loaded with 300 antitank mines each, and one is partially loaded with 250 antitank mines; the other three trucks are empty.

FIFTH REQUIREMENT

16. *a.* What three typical engineer tasks may devolve upon engineers attached to the motorized detachment?

b. What plan would Captain Company A 1st Engineers recommend for the employment of his unit?

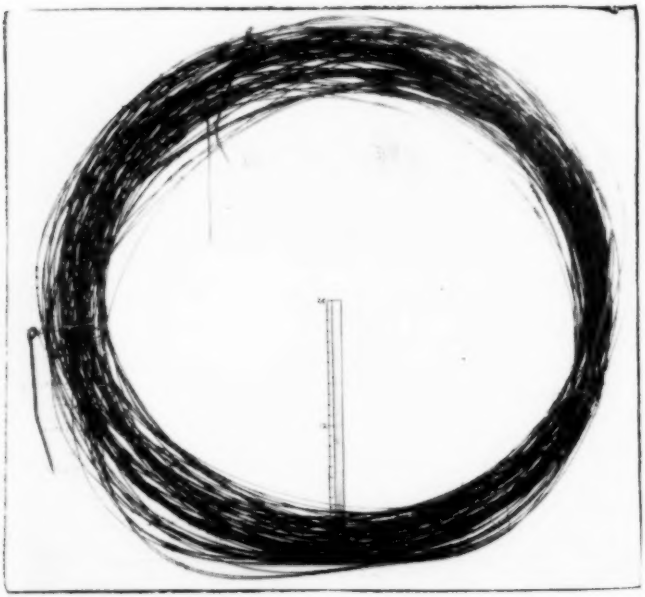


FIGURE 14.—Roll of Concertina wire with anchor pins.

c. An engineer unit would be attached to the motorized detachment. Where would the engineer unit march?

d. How many engineers will be attached to the flank guards sent out by the main body, and what will be their duties?

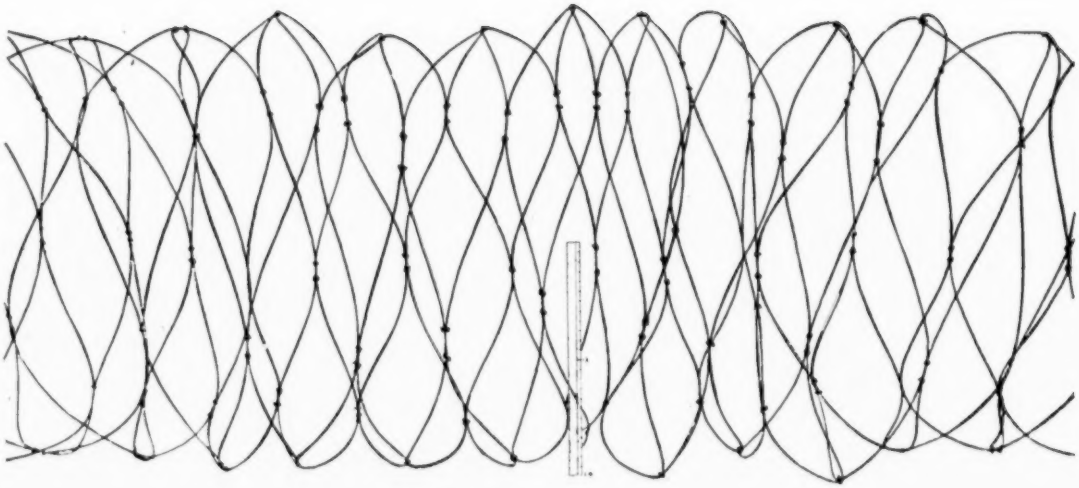


FIGURE 15.—Concertina wire extended. Scale is 2 feet long.

A SOLUTION OF FIFTH REQUIREMENT

17. *a.* Three typical engineer tasks are:

(1) Establishment of obstacles to impede the advance of the Red force.

(2) Engineer reconnaissance.

(3) Removal of obstacles which may impede the advance of our motorized detachment.

b. To have Company A 1st Engineers (less one platoon), with seven additional trucks carrying 50 concertina rolls and 900 antitank mines, attached to the motorized detachment.

To have one platoon Company A 1st Engineers (less detachments with flank guards), with three trucks loaded with 600 antitank mines, march with the 1st Infantry.

c. The engineer company (less one platoon) would move at the head of the main body of the motorized detachment but would have one noncommissioned officer and two men in the trucks of the point of the advance guard for reconnaissance purposes.

d. To attach one noncommissioned officer and three men to each flank guard for engineer reconnaissance and general assistance, dividing 15 concertina rolls and 250 antitank mines between the flank guards and the north flank patrol.

DISCUSSION OF FIFTH REQUIREMENT

18. *a.* The advance of the small Blue force will probably not be opposed by the destruction of bridges, as Red will want to use these bridges for his own advance. Therefore, the engineers' main function will be to impede the Red advance. The engineer company has only two platoons. As basic transportation, each platoon has a tool truck, a truck for transporting company equipment and a half-ton pick-up truck. In this situation additional transportation with road block material has been attached.

b. Maximum engineer assistance must be given to the motorized detachment to assist it in its delaying mission.

A small detail should be sent with the flank guards and an engineer reserve should be provided to meet unexpected demands.

c. The engineer unit with the motorized detachment has a supply of road block material and the transportation and personnel to rush this material simultaneously to several points in order to establish road blocks. The engineer company (less one platoon) is placed at the head of the main body of the motorized detachment to facilitate rapid construction of road blocks and demolitions. For reconnaissance purposes, Captain Company A 1st Engineers arranges to have a small detachment ride in the trucks of the point.

SITUATION, CONTINUED

19. *a.* The main body of the 1st Infantry, reinforced (less antiaircraft artillery and antitank units), will be disposed as tabulated below:

b. The leading elements of Troop A 1st Armored Car Squadron will leave the bivouac area at 4:40 AM and should arrive at the Susquehanna River at 5:00 AM. The head of the main body of the 1st Infantry, reinforced, will leave the bivouac area at 5:40 AM and should arrive at the river at 6:10 AM.

c. The Provisional Battalion 104th Coast Artillery (AA) is assembled in march order in the bivouac area, prepared to leave at 4:40 AM.

UNIT	Approximate number of vehicles	Column length in yards	Time length in minutes 25 mph
Serial 1: Headquarters and Headquarters Company 1st Infantry (less detachments)	20	3,500	4.8
One platoon Company A 1st Engineers	7	1,225	1.7
1st Battalion 1st Infantry (less detachments)	23	4,025	5.5
Mortar Company 1st Infantry (less 2 platoons)	9	1,575	2.1
2d Field Artillery (less detachments)	56	9,800	13.4
Sub-total	115	20,125	27.3
Serial 2: (Time Interval 5 minutes) 2d Battalion 1st Infantry (less detachments)	60	10,500	14.3
One platoon Mortar Company 1st Infantry	3	525	0.7
Battery E 2d Field Artillery	19	3,325	4.5
Sub-total	82	14,350	19.6
Serial 3: (Time Interval 5 minutes) 3d Battalion 1st Infantry	60	10,500	14.3
One platoon Mortar Company 1st Infantry	3	525	0.7
Battery F 2d Field Artillery	19	3,325	4.5
Sub-total	82	14,350	19.6
Serial 4: (Time Interval 5 minutes) 1st Battalion 3d Field Artillery (truck-drawn)	86	15,050	20.5
Combat train, 2d Battalion 2d Field Artillery	21	3,675	5.0
Sub-total	107	18,725	25.6

SIXTH REQUIREMENT

20. *a.* The plan for the employment of the Provisional Battalion 104th Coast Artillery (AA) and Companies H and M 1st Infantry in the *antiaircraft* protection for the motor movement of the 1st Infantry, reinforced.

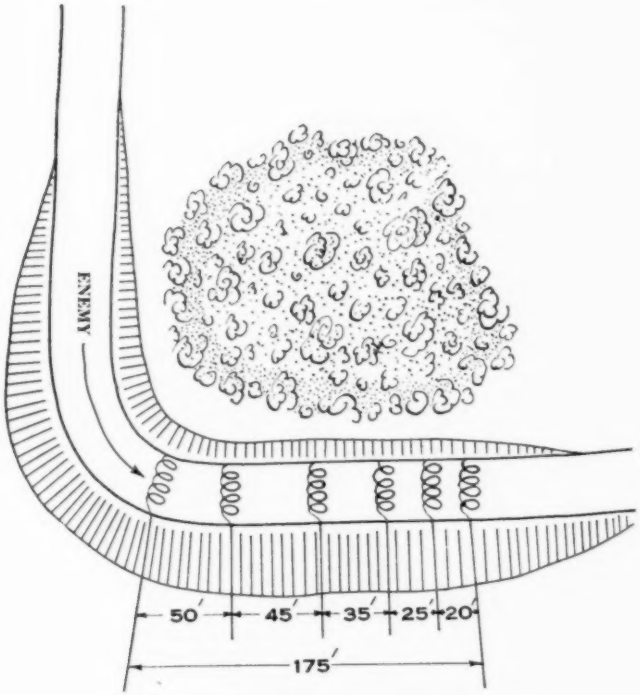


FIGURE 16.—Tactical use of concertina rolls.

b. The plan for the employment of the Antitank Company 1st Infantry (less detachment) in the close-in *antimechanized* protection for the motor movement of the 1st Infantry, reinforced.

A SOLUTION OF SIXTH REQUIREMENT

21. *a.* The Provisional Battalion 104th Coast Artillery (less Battery E) to move at 4:40 AM to Harrisburg, by way of Hummelstown, with the mission of protecting the highway bridges at Harrisburg and the crossing of the Susquehanna River by the 1st Infantry, reinforced, and the remainder of the 1st Brigade. Positions to be occupied east of the river until after the crossing of the motorized detachment. Battery E 104th Coast Artillery (AA) (machine gun) to be attached to Serial 1 of the main body for distribution by section throughout the column. Company H and Company M 1st Infantry to be distributed by section for the antiaircraft defense of their respective serial columns.

b. The Antitank Company 1st Infantry (less one section) to provide close-in antimechanized defense for the main body of the 1st Infantry, reinforced. The company (less two platoons and one section) to be attached to Serial 1; one platoon to Serial 2 and one platoon to Serial 3. These units to be distributed by section in the motor columns.

DISCUSSION OF SIXTH REQUIREMENT

22. *a. Antiaircraft defense.*—(1) Red has observation aviation which may be expected to detect and report promptly the motor movement of the Blue 1st Infantry, reinforced. Furthermore it must be assumed that the Red attack squadron may be used to delay the Blue movement at the earliest practicable moment after its discovery. To estimate the time that will elapse betwen the discovery of a movement and the delivery of an attack on it, three different air situations should be considered. If the Red attack squadron is on its base airdrome at Washington, 95 miles south of the route of march of the Blue 1st Infantry, an air attack cannot be made before about one and three-quarter hours have elapsed after the discovery of the movement. If the attack squadron has moved to auxiliary airdromes, 15 or more miles distance from Newville, the time

between discovery and attack on the movement is reduced to one hour or less. If the Red attack squadron has been ordered to prevent or delay movements for a limited time within a definite area west of Harrisburg, it may be preceded in the air by observation aviation by a short time interval, and an attack launched shortly after the discovery of the movement. In general, the third assumed situation will rarely exist since such a plan will frequently lead to futile flights with no compensating results. Any attempt by Blue to advance west of Harrisburg must be made over the bridges at Harrisburg, therefore this bottleneck is the critical area. In reality, these are heavy concrete bridges, about 1,400 yards long, against which the relatively light demolition bombs of attack planes will probably have little destructive effect. Therefore the most effective way for the Red attack squadron to delay the Blue movement would be to attack the head or forward elements of the truck column on the Harrisburg bridges, or at some point farther west, with the prospect of causing a traffic jam and creating a still more remunerative target for air attack.

(2) The 3-inch gun battery is not effective against low-flying attack planes, therefore it has four organic caliber 0.50 machine guns for its own protection. It would be desirable to have a gun battery forward with the 1st Infantry, reinforced, for protection against observation aviation over the detrucking area, but since only one battery is available it is believed that it will accomplish the most good by going into firing position close to the Harrisburg bridges and firing at all high-flying hostile airplanes of any type. The four organic machine guns of the gun battery will be disposed to protect the gun battery and incidentally assist the 12 machine guns of Battery F in covering the crossing of the bridge against low-flying air attack.

(3) In principle, the combat arms are responsible for their own defense against low-flying air attack. Since it is probable that a Red air attack would be launched against the head of the main body, and, since the machine guns of the 1st Battalion 1st Infantry in Serial 1 have been assigned to security detachments, one machine-gun battery is

assigned the mission of protecting Serial 1. This battery is also favorably disposed to protect the 1st Infantry, reinforced, at the ultimate detrucking area.

(4) Certain passive antiaircraft defense measures will also be relied upon. The movement will be made with the maximum practicable speed in the hopes that it may be completed before an air attack can be launched against it. Dispersion of trucks in the column at ten to the mile will offer a less remunerative target to air attack. If the column can get that far, a suitable detrucking area would be the eastern exits of Carlisle, where the streets would provide numerous turn arounds and permit dispersion at detrucking points, and the buildings would provide cover against air attack.

b. Close-in antimechanized defense.—(1) Motorized antitank gun units normally protect foot and animal columns on the march against hostile mechanized units by leapfrogging by sections to successive critical areas. In a movement by motors this method is impracticable, and since harassment by small hostile mechanized units may come with little warning, the antitank gun sections should be distributed throughout the motor column. The antitank company should be disposed in the column primarliy to protect the elements of its own regiment, thereby giving incidental protection for the engineer, artillery, and other units in the column.

(2) The truck-drawn light artillery was distributed by battery in the column for emergency employment against hostile mechanized attack. This should not interfere with the employment of the light artillery on normal artillery missions when contact is gained, as the artillery is motorized and will be available as rapidly as needed. Another advantage gained by the dispositions adopted in the motor column in this situation is that Serials 1, 2, and 3 each constitutes a combat team which may be employed as a tactical unit if so desired.

CHAPTER 3

Defense in Woods

(AN INFANTRY SCHOOL TEACHING)

"In respect to the decrease in the effectiveness of fire, increase in the importance of close combat, difficulty in the control of troops and reduced effectiveness of aerial observation, combat in woods partakes in a lesser degree of the characteristics of night combat." (FSR, paragraph 567.) This statement taken from the Field Service Regulations epitomizes the characteristics of fighting in woods and applies to both the offense and defense.

Steele, the historian, in his work on American Campaigns, had this to say regarding the Battle of the Wilderness: "Most of the bad tactics of the battle can be charged to the dense underbrush and lack of roads. Organizations could not keep intact; commanders could not see or keep in touch with their lines; positions could not be pointed out, described or identified; columns could not be directed; distances could not be estimated nor could the time be calculated that troops would take to go from one point to another; at fifty paces friends could not be distinguished from foes and neither could be seen a hundred yards away." This quotation describing woods fighting as actually encountered in a historical situation, is given to emphasize the importance of careful training of troops for such operations.

Besides the adverse physical conditions and natural impediments present, consideration should also be given to the psychological factor involved. There will be present an atmosphere of general uncertainty and confusion. The

unconscious "fear of the forest" may be increased many fold by the exaggerated reverberations of firing weapons, the burst of shell, the whining of ricocheting projectiles and shell splinters, the crash of falling trees and all the other noises of battle. When all of this is added to the general obscurity of what is taking place beyond the area of personal visibility, it produces in the mind of untrained officers and soldiers a fear difficult to overcome.

While the classification of any type of woods or the definition of any kind of trees would be only relative, nevertheless in order to have a common understanding during this discussion, the following definitions are given:

"Deep" woods is a wooded area sufficiently large to provide ample concealed maneuver space for large bodies in depth, e.g., a woods which would conceal the assault and reserve echelons of a regiment in attack or which will conceal both the main line of resistance and the regimental reserve line could properly be called a "deep" woods.

"Shallow" woods is a wooded area not sufficiently large to conceal a large unit as indicated above.

A dense woods is a wooded area where the growth is sufficiently dense to interfere with vision to the extent that maneuver is seriously limited.

Open woods interfere little with maneuver and therefore are not considered in this article.

Woods which present conditions of low visibility similar to darkness and smoke handicap both the attacker and the defender. However, the attacker will find his effectiveness impaired to a greater extent than will the defender. In the Civil War Battle of the Wilderness, 4/5 May, 1864, Grant, with a well-equipped and well-disciplined force of 100,000, attacked Lee with approximately 61,000 and was unable to defeat him.

While the wide extent of the forested areas of the world may not be ideal terrain on which to conduct campaigns and fight battles, woods are so universal that few campaigns and battles of the past have been fought without being affected by them. Only a casual study of the American operations in the World War discloses that

many of our battles were fought in, around, and about woods. America's biggest offensive, the Meuse-Argonne Battle, was in fact a series of semi-coordinated engagements waged in and about various wooded areas, the largest of which was the Argonne Forest proper. Belleau Woods, which will again be referred to in this article, was a sanguinary fight for the possession of a small patch of woods. Future combat in the Central American countries or much of the tropical area of the world will be conducted in forest and jungle.

During preparations for battle an attacker will utilize the cover and concealment afforded by woods for the concentration of his troops. Two striking historical examples of such concealment are the allied concentrations in 1918 against the Chateau-Thierry salient. In May and June 1918, Marshal Foch moved and concealed approximately 20 American, French, and Itallian divisions in a defensive concentration in the forested area south of Rheims on the east flank of the salient. Again prior to the Battle of Soissons and the Allied offensive against the west flank of the salient, he assembled 11 infantry divisions, 2 cavalry divisions and over 100 batteries of field artillery in the Forest of Villers-Cotterets. Both of these great concentrations were made secretly and without being observed by the Germans.

Due to certain inherent advantages which woods offer to both the defender and attacker, we may expect increased utilization of wooded areas for combat. As mentioned above, the attacker has concealment and cover for his concentration and approach march. While advancing the attack and launching the assault the natural difficulty of maneuvering within woods places the attacker at a disadvantage. On the other hand, the defense has many advantages. He has cover and concealment for his organized positions; shelter for his reserve formations and, in addition, may utilize the woods as an obstacle. The defender, in many instances, will have made detailed reconnaissances of the woods and will know its characteristics, its roads and trails. This gives a great advantage over the attacker,

who may have little or no information of these important features.

Woods materially affect certain considerations which must be taken into account in every tactical operation, viz: "observation", "fields of fire", "concealment and cover", "obstacles", and "communications."

For both the attacker and the defender, observation and fields of fire are reduced and communications are more difficult. On the other hand, cover and concealment are increased.

EFFECT OF WOODS ON DEFENSIVE COMBAT

The basis of the defense is its defensive fires. It seeks to prevent the attacker from reaching its position with formed units of sufficient strength to overrun that position.

The defensive fires are designed to disorganize and demoralize the attacker before he can reach the defensive position. While woods reduce the effectiveness of these fires, they partially accomplish the very disorganization of the attack desired by the defender. They help to break up the attacker's formation, cause loss of control and destroy the cohesion and coordination essential to a successful attack. A vivid historical example of this is the description of the Battle of the Wilderness quoted above.

Infantry weapons, being well suited for close range fighting, should be used as the primary weapons for woods defense. Woods affect the fire of all weapons and in general reduce the effectiveness of their fire commensurate with the size and density of the growth. This is true of flat trajectory weapons to greater extent than that of high-angle fire weapons. While this reduction is in a large measure due to poor visibility, in densely wooded areas many of the projectiles are stopped by the trees at comparatively short ranges. When positions with sufficient elevation are available towards the rear of the defensive area, the plunging fire of heavy machine guns (Browning caliber 0.30, water-cooled) delivered over the tree tops may be suitably employed. Within the woods all roads,

paths, and trails should be enfiladed with rifles, light machine guns (Browning Automatic Rifle, modified) and heavy machine guns. Cleared spaces and the forward edges of obstacles must be swept with all types of infantry fire.

A historical example of the destructiveness of defensive infantry fire is the German defense of Belleau Woods. In a personal experience monograph given at The Infantry School, the author describes the severe repulses suffered by two platoons of the 47th Company 5th Marines when they attempted to rush across a small clearing of about 100 yards square. These two platoons met a withering machine-gun cross fire at close range and were nearly annihilated. German machine guns were mutually supporting and ingeniously hidden throughout the woods; trench mortars were placed so as to cover the front of the defensive position and artillery emplaced outside of the woods fired in support of the defensive positions within the woods. Movements of Americans on paths and trails were always under fire and severe casualties were suffered. A quotation from the monograph reads as follows: "A little path that ran east and west through the woods was under fire from another patch of woods along the Belleau-Bouresches Road. All paths in the woods were kept under fire."

Field artillery is of little value in heavy dense woods because of the lack of observation and positions from which to fire. If there are no clearings which will provide battery positons, they must be prepared—a slow tedious project. Because of their flat trajectories, guns require more extensive clearings than do howitzers or infantry mortars. The interdiction of roads and trails, and the harassment of enemy assembly areas considerably in front of the defensive position may be accomplished by field artillery emplaced well to the rear and firing over the tops of the intervening trees. Artillery medium howitzers are more effective than guns.

Terrain studded with small woods or groups of trees or underbrush is very suitable for artillery from all points of view. For the close support of troops actually engaged

within a wood, infantry mortars and 37-mm guns are far more useful than field artillery weapons.

Of greatest importance to the defense is the protection that woods afford against tank and mechanized cavalry attacks. A dense woods containing large trees is an obstacle to the movement of these vehicles. The defense should locate its position to fully utilize this natural obstacle. Wooded areas, which as a whole will not stop the movement of armored vehicles, will often have clumps of large trees which are definite obstacles; the protection afforded by such areas should be fully exploited; they should be occupied by the units which will defend the main line of resistance. Amidst such trees should be located the antitank weapons. Thin woods and small trees which will not stop the movement of tanks are nevertheless an obstacle to their movement. In such woods tanks are forced to move at reduced speed and easily lose direction; this gives the defense an opportunity to make dispositions to meet the assault. Whenever time is available the defense should augment the natural obstacles with artificial obstacles and traps; wooded areas favor the easy concealment of such devices. Full use should be made of tank mines along roads, clearings, and the limited avenues of approach available to tanks.

Horse cavalry cannot operate advantageously in woods combat except when dismounted. The movement of any large bodies of mounted troops through woods is difficult except on roads and trails. Such movement is easily determined and faces the danger of being ambushed. However, horse cavalry patrols may be employed in conducting a reconnaissance of woods.

The atmospheric conditions found in woods tend to increase gas persistency. Due to this fact the defense may expect gas concentrations on small woods and on the occupied sectors of large woods. Areas which have been subjected to persistent gas should be evecuated by the defenders but should remain under close observation to discover the movements of enemy forces wearing protective clothing. A smoke screen placed on the defensive position

remains much longer in wooded areas than on open terrain. The defender may employ barriers of persistent chemical mines to deny certain areas that cannot be included in the defensive position.

While woods are not immune from aerial attack, they offer negative protection against both observation and attack aviation. Thick forests of deciduous trees in leaf give excellent concealment when defending troops observe precautions with reference to camouflage and movement. Evergreens have the advantage of giving concealment in all seasons of the year. Regardless of the degree of natural concealment, it should be the invariable rule that defending troops employ camouflage and utilize every artifice for hiding the exact location of their position and works. Friendly air service should reconnoiter and photograph the defensive position to assist the ground forces in securing maximum concealment from the wooded area.

Engineers and engineering tools are important when a defensive position in woods is organized. Every effort should be made to increase the effectiveness of the woods as an obstacle and to provide fields of fire. Heavy entrenching tools, cross-cut saws, and explosives, are especially valuable in preparing a position for defense. Fields of fire should be improved and extended by clearing the underbrush and trimming the lower branches of trees. Lanes should be cut for machine-gun fires along the front and flanks of organized areas; however, care should be taken that such lanes are not so well defined that they may be readily seen from the air, else the organized position will be located. Wire should be errected to give close protection to the defensive combat groups and to force attacking elements to move into areas covered by machine-gun fire. Tank obstacles and pits should be constructed.

DEFENSIVE METHODS

Many considerations will enter into determining the best location of the defensive position. Under certain tactical situations the unit commander may have some choice in selecting his main line of resistance. In such

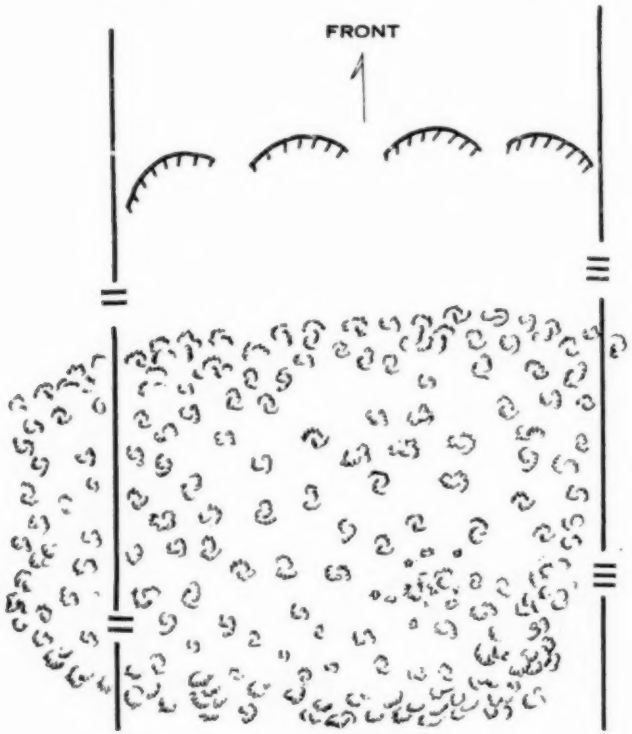


FIGURE 17.—Defense in front of woods.

cases he will find that the defense of a wooded area may be made in four general ways. Briefly stated the advantages and disadvantages of each of these ways are tabulated at the bottom of the schematic diagrams, illustrating the four possible locations.

(a) DEFENSE IN FRONT OF WOODS (SCHEMATIC ONLY)

ADVANTAGES.—

1. Close and coordinated infantry and artillery fire support.
2. Movement of reserves, supply and evacuation partially concealed.
3. Counterattack facilitated.
4. When Regimental Reserve Line is within the woods it requires the enemy to make two separate attacks to overrun the battle position.
5. Escapes artillery fire delivered against the edge of woods.

DISADVANTAGES.—

1. No cover for Main Line of Resistance against hostile infantry and artillery fire.
2. No natural obstacle to protect Main Line of Resistance against tank attack.

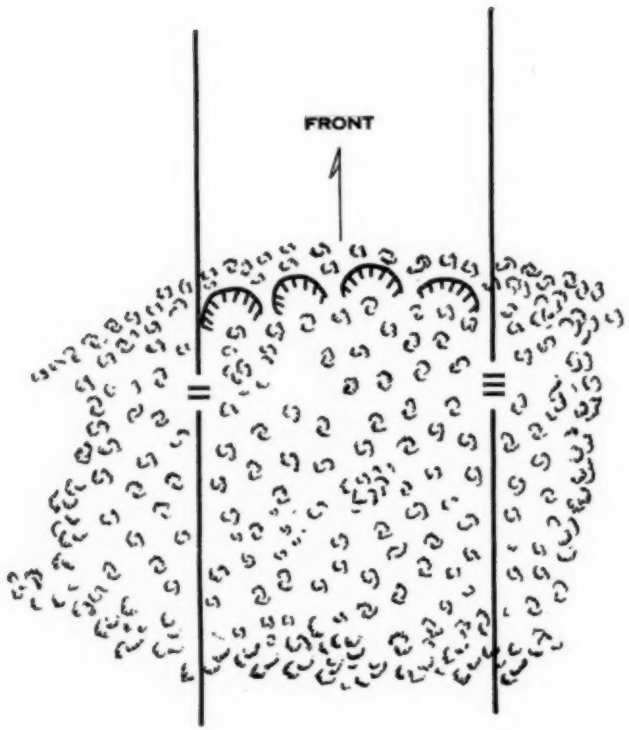


FIGURE 18.—Defense at forward edge of woods.

(b) DEFENSE AT FORWARD EDGE OF WOODS (SCHEMATIC ONLY)

ADVANTAGES.—

1. Facilitates excellent defensive barrages.
2. Good fields of fire.
3. Obstacles against tank assault.
4. Cover and concealment for supply, evacuation, communication and location of reserves.

DISADVANTAGES.—

1. Favorable target for hostile infantry and artillery fires.
2. Difficult to counterattack through woods to regain lost positions.

Under most conditions the forward edge of a woods is the least desirable location for the main line of resistance. Usually the enemy will have good observation of this forward edge and, firing in close support of his attacking infantry, can place heavy concentrations of infantry and artillery fire on this locality.

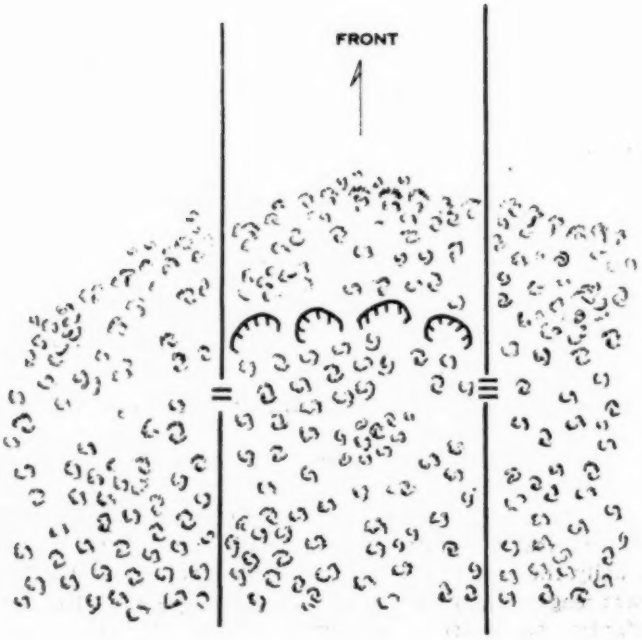


FIGURE 19.—Defense within woods.

(c) DEFENSE WITHIN WOODS (SCHEMATIC ONLY)

ADVANTAGES.—

1. Operation of hostile tanks difficult.
2. Control and coordination of hostile attack difficult.
3. Hostile fire support loses efficiency.
4. Cover and concealment for supply, evacuation, communication and movement of reserves.

DISADVANTAGES.—

1. Observation restricted.
2. Surprise actions by enemy favored.
3. Difficult to obtain close infantry and artillery fire support.
4. Difficult to control counterattacks to regain captured positions.

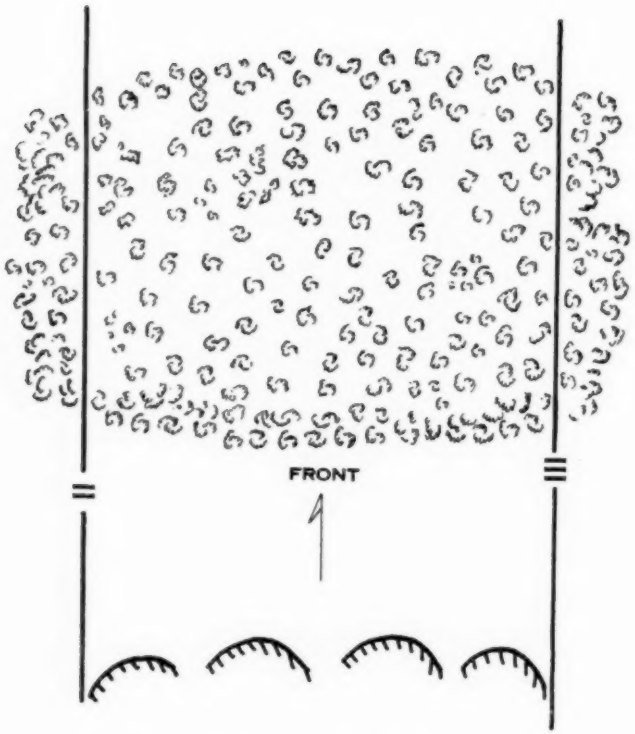


FIGURE 20.—Defense in rear of woods.

(d) DEFENSE IN REAR OF WOODS (SCHEMATIC ONLY)

ADVANTAGES.—

1. Exits of woods under observed and coordinated fire.
2. Utilizes woods as an obstacle.

DISADVANTAGES.—

1. Gives attacker cover and concealment for his concentrations and approach movements.
2. Base for enemy departure.
3. Surprise for enemy attack.

The four cases outlined above are guides for the selection of the strongest defensive position. In any tactical situation other considerations may dictate the exact location of the defensive position. These may be terrain features, the limiting points on the main line of resistance, whether the unit is on a flank or occupies an interior position, or orders to carry out the defensive scheme of the higher commander. For example, in order for an interior battalion to coordinate its defensive position with adjacent units, it might be forced to occupy an area in rear of a woods rather than within it or along the forward edge. Again, the location of the defensive observation might dictate that the defensive position be taken up in front of the woods rather than within the woods. In some cases, where a woods is on the reverse slope of a hill, the forward edge of the woods not being under hostile terrestrial observation and thus not under observed artillery fire, might be more desirable than a position within the woods.

Regardless of whether the defender elects to defend within the woods or in rear of it, provision should be made for observation from the forward edge. Unless the distance between the main line of resistance and the forward edge is too great, the forward edge should be occupied by security detachments with the mission of observing and delaying the hostile approach. Every effort must be made to prevent the hostile attacking echelons reaching the woods in formation and under control. After having been forced to withdraw from the edge of the woods, the security detachments should contest any continued advance of the attacking force; this serves to break up the hostile formations and causes loss of direction and control. The continued opposition by covering troops also conceals the location of the defender's main line of resistance and the attacker arrives before it with little definite knowledge of its exact location or strength. Many times the covering troops can decoy the attacking troops into fire-swept areas.

When the battle position is placed either in front of or in rear of the woods there is no variation from the defensive principles given for open terrain. When the battle position is located within the woods, conditions are altered and special provisions have to be made. The terrain factors of limited visibility and limited fields of fire immediately dominate the situation and tend to reduce distances and intervals. Combat groups can cover smaller frontages with their fire; intervals between groups must be closed up to insure that no avenues are available for enemy infiltration between these combat groups, and supporting and reserve echelons moved closer to the main line of resistance so as to be more readily available for counterattacks. Local supports must be near enough to the main line of resistance to give them effective observation of the forward combat group area. Their exact location is dictated by their twofold mission: (a) to fire in the intervals between the forward combat groups and (b) to make local counterattacks for restoring the forward combat groups. Since woods fighting is primarily close fighting of foot troops, it should be understood that the primary mission of the local supports is one of counterattack.

Even though the defensive area is reduced in size, it is still organized in depth. The difference between a defensive organization in woods and on open terrain is primarily the difference in the size of the area occupied. In the open, a battalion may organize a defensive area with a frontage of 800 or more yards, and a depth of 500 to 1,500 yards; in woods it will be necessary to decrease both frontage and depth. The basic principle is that the battalion area must be closely knit, designed to prevent the unopposed penetration of small hostile forces and the attack of combat group in flank and rear.

The reduction in the frontage occupied by a battalion does not mean that the battalion places fewer units or men on the main line of resistance; it is a reduction in the intervals between combat groups and the spaces between

the individuals in the combat groups. As previously pointed out, reduced range of visibility may permit the attacking infantry to approach close to the defensive position and then overrun an extended combat group with local superior force. Only by closing in the intervals between the combat groups and the spaces between individuals in the same combat group will sufficient strength be present to meet these assaults. The intervals must also be reduced so that all of the front line is under observation and fire.

Troops occupying the battle position in woods must expect close combat and thus should have a high state of training and discipline. Instead of having the close support of artillery and the assistance of adjacent combat groups, units will find themselves engaged in separate fights in which the efficient and determined leadership of small unit commanders is essential to the maintenance of the entire defensive position. If the situation seems vague to the defender it should be remembered that it is even more vague to the attacker.

Woods fighting is a battle of individuals and small groups. This gives the opportunity and often creates the necessity of counterattacking by smaller units than is usual in open terrain. As a result, reserves are smaller and more numerous than defensive organization on open terrain. Each company on the main line of resistance should have a small reserve. These small reserves are frequently kept mobile and so placed that they can occupy prepared positions in support of the main line of resistance or can counterattack within the area of the strong point. Battalions should have reserves within their respective centers of resistance for the same purpose. Units placed in reserve should have detailed plans for counterattacks and when time and opportunity permit these plans should be rehearsed.

Of high importance to the defender is his system of communication. Using due precaution to guard against observation, routes should be thoroughly reconnoitered and marked. All personnel should be made familiar with the routes and the location of adjacent and supporting

units. Detailed plans for the conduct of all groups in any probable emergency should be developed and rehearsed when time permits.

Woods are of particular value to units fighting delaying actions and covering the withdrawal of main bodies. Small units deployed on a wide front and along the forward edge of a woods force the pursuing enemy to await supporting fires before attempting an assault against the woods. This gains time for the withdrawal of the main body. When the hostile assault is launched, the delaying detachment breaks contact and makes its escape under cover of the woods.

History records that wooded zones have always proven favorable to the defender. They enable him to offer a strong resistance to the hostile attack with weak forces, thereby making the correct application of the economy of force principle.

Repeatedly during the World War it was demonstrated that the offensive made greater gains over open terrain than it did through wooded areas. The corollary of this is that defense in woods offers the greatest resistance. The historical example of Belleau Woods, already mentioned in this article, seems to prove this. This now famous woods has an area of only about 1,100 by 2,200 yards, yet it took the Marine Brigade of the 2d Division 21 days, from June 6 to 26, with a total loss of 113 officers and 5,000 men to capture and dominate this comparatively small woods.

SUMMARY

The following summations may be made from studies of combat in woods:

Due to the extensive areas of forests and certain inherent advantages which woods offer to both the attacker and defender, frequent combat in woods may be expected in the future.

Combat in woods is primarily "close combat"; therefore foot troops are the principal arm employed for such combat.

Training, discipline, and initiative on the part of commanders of small units are all essential to successful woods fighting. Units should be familiarized with this type of fighting by intensive training before being employed in actual combat.

The loss of control in woods fighting is a dangerous probability and exceptional efforts are necessary to preserve the integrity and cohesion of combat elements.

Woods favor the defender over the attacker, but the defense must not neglect artificial improvement of natural obstacles in the occupation and organization of its position.

The defense in woods is essentially the same as the defense on open terrain. The prime difference lies in the reduction of the size of the area which a unit is capable of defending. Reserve elements should be located close to the supported units and when possible have a rehearsed plan of employment.

To overcome the handicap of poor visibility, communication should be highly developed within the centers of resistance.

Woods are of great importance to the defense as obstacles against mechanized attack; therefore, the defense should utilize this natural obstacle whenever possible.

Hostile aviation, both observation and attack, is handicapped in its operations against defenders in woods, but the installation of obstacles and the organization of the defensive position must be camouflaged to prevent detection from the air.

Because of inadequate observation, close artillery support for either the attack or defense in woods is difficult. Artillery to be employed effectively in support of a defensive position in woods, should be located outside of the woods or in ample cleared areas; its targets should be known or probable hostile assembly areas, communication and command centers, roads and routes of hostile approach.

CHAPTER 4

Employment of Screening Smoke

(INFANTRY SCHOOL TEACHING)

This chapter discusses the means and methods of producing screening smoke, its physical behavior in the field, and its tactical employment.

Screening smoke was used in military and naval operations by the ancient Greeks and Romans. But from their time until the World War, history records but few instances of its deliberate employment as an aid in battle.

The World War saw a tremendous development in the power of the defense, accentuating, beyond all precedent, the need for the fire of supporting weapons to enable attacking infantry to advance. To this end, long periods of intense artillery preparation were resorted to, but these tended to forfeit surprise. Moreover, the defender, by burrowing deeper into the ground, often was able to withstand this fire, and emerge from his dugouts in time to man his fire trenches and beat off the attack. Smoke then came into use to screen the attacking infantry from hostile observation. It proved an invaluable aid and made it practicable to shorten materially the period of artillery preparation.

The first smoke munitions used during the World War were candles which had to be placed in position and ignited by hand. These were of limited value. But the development of smoke projectiles made it possible to place smoke directly upon an enemy, to blind the observation of the enemy but not that of the attacking troops, and thus allowed the tactical value of smoke to be fully realized.

Smoke is now an accepted means of providing concealment where none naturally exists, and of artificially creating periods of low visibility in order to confuse the enemy and conceal our own plans and movements. In any future struggle the infantry will certainly encounter hostile smoke.

Smoke operations on a considerable scale are normal functions of chemical troops, artillery and the air corps. However, the infantry may have frequent occasions to place smoke screens with its own mortars, or to use smoke pots or candles. Thus the employment of smoke becomes a matter of direct concern to the infantry. Consequently all infantry officers should be familiar with the tactics and technique involved. For smoke is a "two-edged sword". Improperly used, it may interfere seriously with other operations, and aid the enemy rather than ourselves. Like other chemical weapons, its effectiveness is influenced by numerous variable factors.

SCREENING SMOKE MATERIALS AND MUNITIONS

A cloud of screening smoke consists of a myriad of minute solid or liquid particles temporarily suspended in the air. White smoke obscures objects behind the cloud by refracting light rays in the same manner as a ground-glass window. It is much more efficient for screening than black or colored smoke. These smokes absorb light rays, but, unless the clouds are extremely dense, they allow sufficient light to pass through to prevent complete obscuration.

The materials and munitions described or referred to in this chapter are standard in our service for producing screening smoke.

White phosphorus (symbol WP) is a solid substance which burns spontaneously on exposure to the air producing a dense white smoke. WP is the most efficient of all known screening agents. It is standard for war-time use in mortar and artillery smoke shell and aircraft bombs. An explosive charge is employed in these munitions to break up the phosphorus into small particles and disperse them.

HC mixture (symbol HC) is a powdered material used in smoke pots, which produces a grayish white smoke on burning. These munitions are placed in position and ignited individually by hand, or wired together and ignited simultaneously by an electric current.

To operate a smoke pot, remove the lid, place the pot on the ground and strike the match head with the striker block.

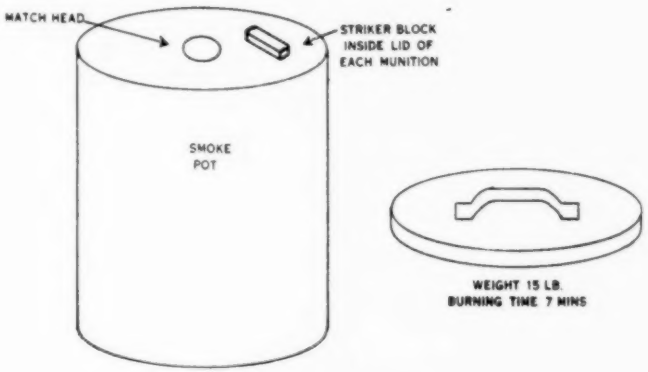


FIGURE 21.—Smoke pot.

Smoke pots are designed primarily for training purposes, but munitions of their type may often be useful in war to generate smoke clouds within friendly lines. A small size smoke candle which can be carried by a soldier in his pocket has been developed and, presumably, might be provided as a standard munition, if needed in war.

Sulphur trioxide solution (symbol FS) is a liquid which fumes when exposed to the air, producing a white smoke. FS is standard for spraying smoke by airplanes. It is also used in explosive smoke shells for training purposes, being less dangerous than WP in case of premature bursts, and having no incendiary properties.

WEATHER AND TERRAIN INFLUENCES ON PHYSICAL CHARACTERISTICS

Cool, cloudy weather with high humidity, fog or light mist, and a steady wind of low velocity of from five to eight miles per hour, give the most favorable weather conditions for the production and use of smoke.

Winds having a velocity of above ten miles per hour and gusty and variable winds tend to tear smoke clouds apart and dissipate them rapidly. Winds below three miles per hour are likely to shift suddenly.

Sunshine, especially in warm weather, causes rising air currents (convection) which dissipate smoke by carrying it upward.

High humidity favors the production of smoke since the smoke particles either absorb or react chemically with water vapor to increase the density of the cloud.

Rain, especially if heavy, destroys smoke by beating it out of the air.

Smooth open terrain is the most favorable for smoke. Rugged ground and trees cause eddying air currents which produce rifts in a smoke cloud.

Smoke moves with the wind, becoming more and more dilute as it travels from its source. To maintain a smoke screen, continued production of smoke is necessary. Smoke from a single shell is effective for about 200 yards down wind from the point of burst. Hence, when the wind is parallel to the front, 200 yards is the minimum screen that can be laid.

The movement and dilution of a smoke cloud are characterized by lateral spread, vertical rise, drag effect, and settling out. These terms are explained below.

LATERAL SPREAD

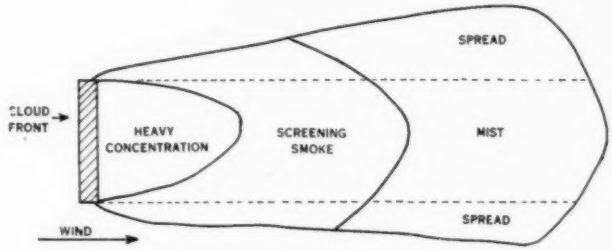


FIGURE 22.—Lateral spread of smoke cloud.

Lateral spread results from eddying air currents caused by variations of the terrain. Under highly favorable conditions the spread amounts to 15 per cent of the distance traveled; under average conditions it is 20 per cent.

VERTICAL RISE

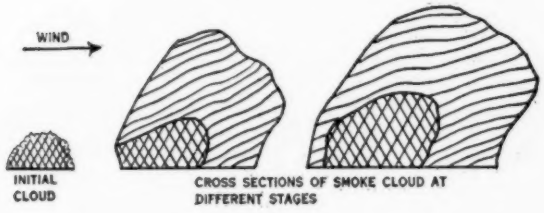


FIGURE 23.—Vertical rise of smoke cloud.

Vertical rise is due to upward air currents (convection). The amount of rise, under average weather conditions, is about 20 per cent of the distance traveled. Smoke generally will rise even when produced in a still atmosphere, because its production is invariably accompanied by the evolution of heat, which warms and expands the air within the cloud.

DRAG EFFECT

Smoke clouds move with a rolling motion increasing in length as they travel. This is referred to as "drag effect". It is due to the fact that the top and forward portions of

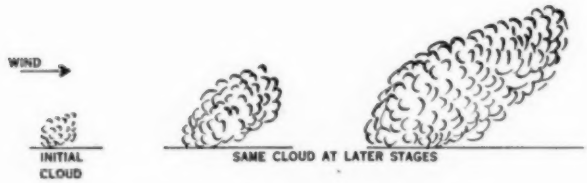


FIGURE 24.—Drag effect of smoke cloud.

the cloud, being more exposed to the wind, move faster than the bottom and rear.

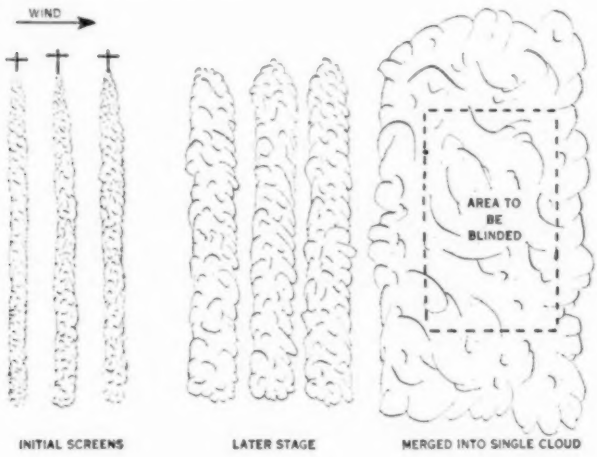


FIGURE 25.—Drag effect on airplane smoke cloud.

Drag effect causes parallel clouds laid cross-wind to merge. It is taken advantage of in smoke blanketing operations by aircraft.

SETTLING OUT

As a smoke cloud moves along, the smoke particles gradually evaporate or settle out on ground and vegetation.

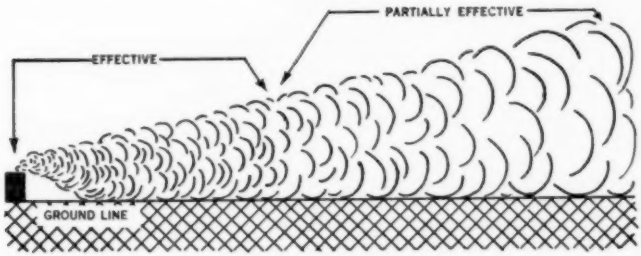


FIGURE 26.—Cloud from a single point (side view).

REINFORCING A SMOKE CLOUD

As a single smoke munition will produce an effective smoke screen for only about 200 yards, if it is desired to

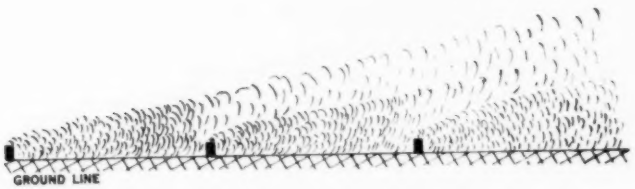


FIGURE 27.—Reinforced cloud (side view).

create a larger screen it will be necessary to reinforce the smoke cloud with additional munitions.

EFFECT OF POSITION OF A SCREEN ON RIFLE FIRE

For economy of ammunition, it is desirable to place screening smoke on, or as near as possible to, the hostile observation point or area, rather than near the object to be obscured from the hostile observation point or area. This is on the principle that the nearer to the eye we place a screen, the smaller the screen need be to blind observation.

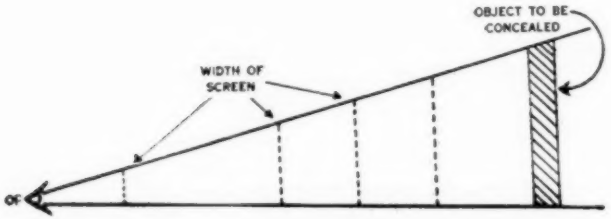


FIGURE 28.—Locating a smoke screen.

However, economy is only one consideration. Another, and frequently a more important one, is the effect of the smoke upon our own and the enemy's fire. The nearer to the enemy we place smoke the more it will tend to impair his fire efficiency, and the less it will interfere with our fire.

Thus where smoke is used to aid attacking infantry it should be placed directly upon the hostile forward position so as to cover it with the cloud. Then the enemy cannot see any target, perhaps he cannot see the sights of his weapons, and must depend largely upon predetermined sighting of weapons or chance hits. This principle has been demonstrated repeatedly in tests carried out on a rifle range at The Infantry School, as illustrated below.

The firing was conducted in three phases as follows:

1. In this phase five rounds were fired in one minute by each student officer. The targets were then marked, hits announced, percentages recorded, and the results were

used as a basis for determining the effectiveness of the subsequent firings. Based on the number of rounds fired, approximately 45 per cent hits were secured.

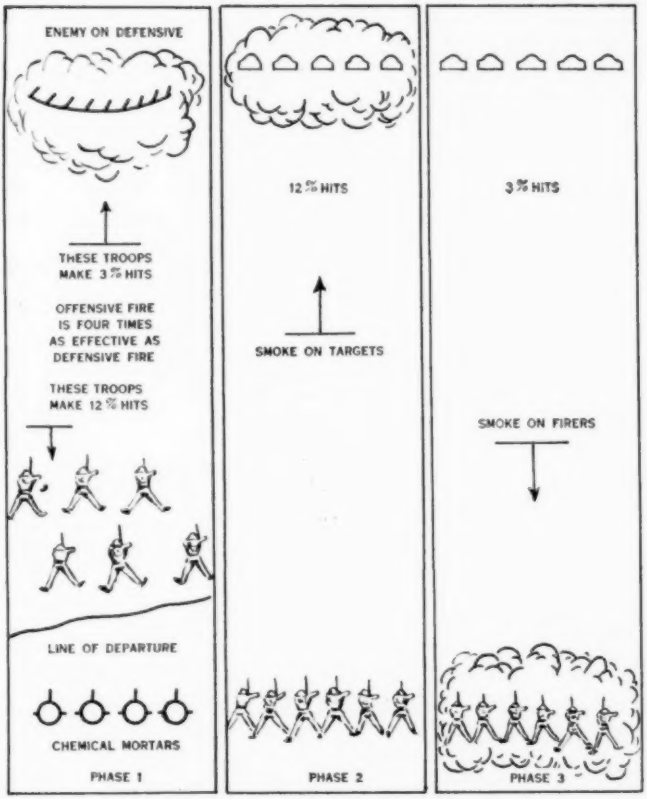


FIGURE 29.—Effects of smoke on rifle fire.

2. In this phase smoke was placed on the targets by candles placed immediately in their front. These candles simulated the use of mortar fire (smoke) placed on and just in front of an enemy position. The candles were fired electrically and the volume of smoke was sufficient to

obscure the targets from the firers. Five rounds were fired by each student officer in one minute. An average of 14.0 per cent hits was obtained.

3. In this phase the smoke was placed on the firing line by the use of candles emplaced in the immediate front and upwind from the firers. The resulting smoke was sufficient to obscure every object from the firers. Each student officer fired five rounds in one minute. An average per cent of 3.5 hits was obtained.

The following results stand out:

a. The percentage of hits obtained with smoke on the target averages about one-third that obtained without smoke.

b. The percentage of hits obtained with smoke on the firer averages about one-twelfth that obtained without smoke.

Phase 3 is the situation of an enemy upon whom smoke has been placed while Phase 2 is that of the attacking infantry protected by smoke.

These tests plainly indicate that so far as rifle fire is concerned THE SMOKE SHOULD BE PLACED ON THE TARGET. Then the offensive fire is more effective than the defensive fire. Furthermore, infantry advances either by concealment or fire superiority, and smoke can be used to help in both instances.

FIGURE 30.—4.2 chemical mortar firing smoke shell.

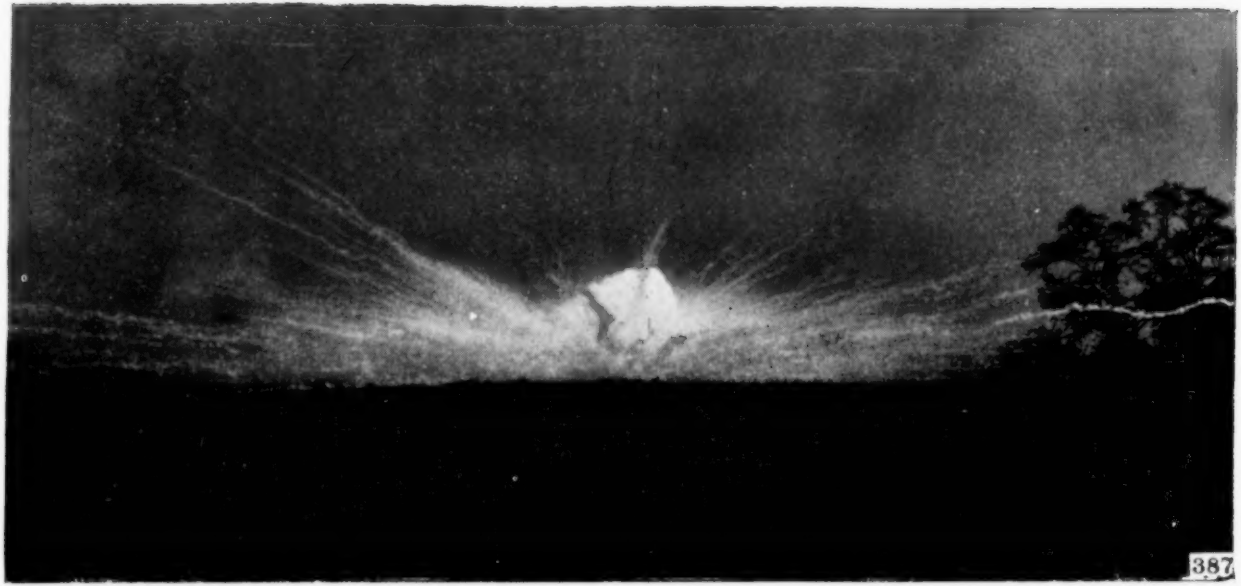


FIGURE 31.—Burst of 4.2-mm smoke shell. Note flying particles of white phosphorus.

SCREENING WITH PROJECTILES

The wind direction with respect to the front to be covered with smoke is the controlling factor in determining where the shell bursts are to be placed. To establish the initial screen, we should fire twice as many rounds during the first minute as we estimate are necessary to maintain the screen for any subsequent minute.

Another consideration affecting fire technique is the purpose for which the smoke is to be used. If screening effect only is required, ammunition may be conserved by placing the center of impact well short of the hostile position so as to take full advantage of the spread and travel of the cloud produced by each round. However, where casualty effect as well as screening is important, a considerable portion of the shells must fall directly upon the hostile position. In this case the bursts must be placed closer together and considerably more ammunition is required.

The amount of ammunition required to lay and maintain a smoke screen varies with the weapon, the wind conditions, and the type of chemical agent. With 4.2-inch chemical mortars, using shell loaded with white phosphorus, the average maintenance requirement is one round per minute per 100 yards of frontage.

If a number of projectiles are fired from a mortar or artillery piece in fixed position, the impacts will not be at the same point but will be dispersed over an area. In the accompanying illustration, the rectangle has been divided

into eight equal parts both along the depth or range axis, and along the width or deflection axis. From the diagram can be determined the probable errors in range and deflection. The probable error varies with the range, the

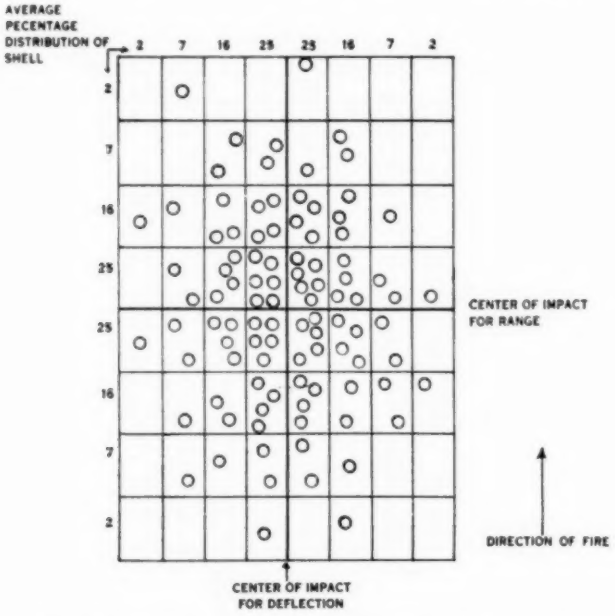


FIGURE 32.—Rectangle of dispersion—chemical mortar.

weapon, and ammunition. For the 4.2-inch chemical mortar firing at 2,000 yards, it is 20 yards in range and 10 yards in deflection. These characteristics of the particular weapon are important considerations in the technique of firing smoke.

SCREENING WITH A FOLLOWING (6 O'CLOCK) WIND

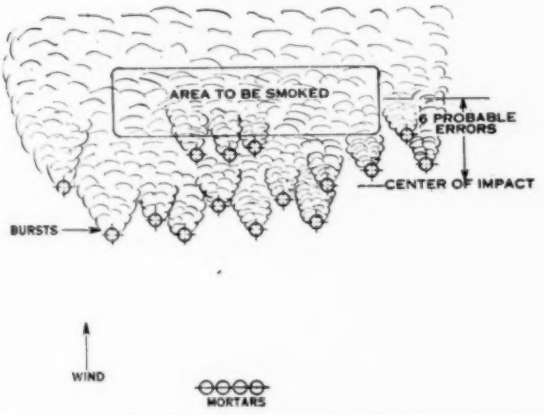


FIGURE 33.—Smoke used for screening purposes only.

For screening effect only, distribute bursts in front of but close to the target.

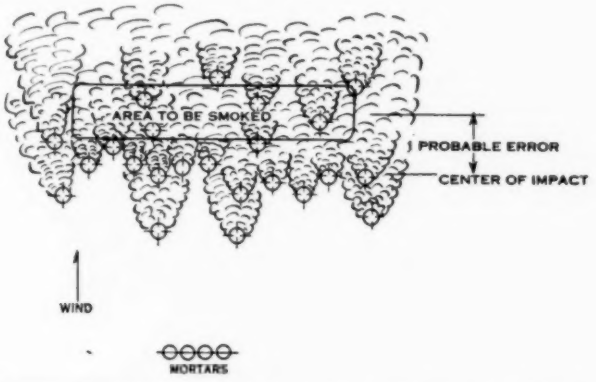


FIGURE 34.—Smoke used for screening and casualty effect.

For screening and casualty effect, distribute bursts in front of target so that a considerable proportion of them fall on the hostile position.

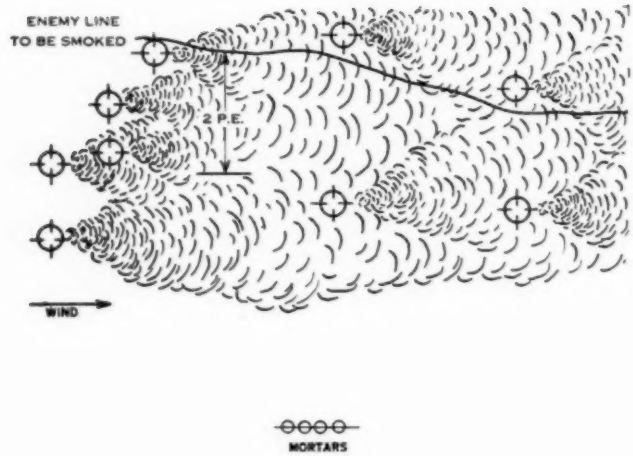


FIGURE 35.—Screening with a flank wind.

SCREENING WITH A FLANK WIND

Fire upwind and somewhat short of the target, and fill in downwind as necessary to reinforce the screen. Less ammunition is required than in any other case.

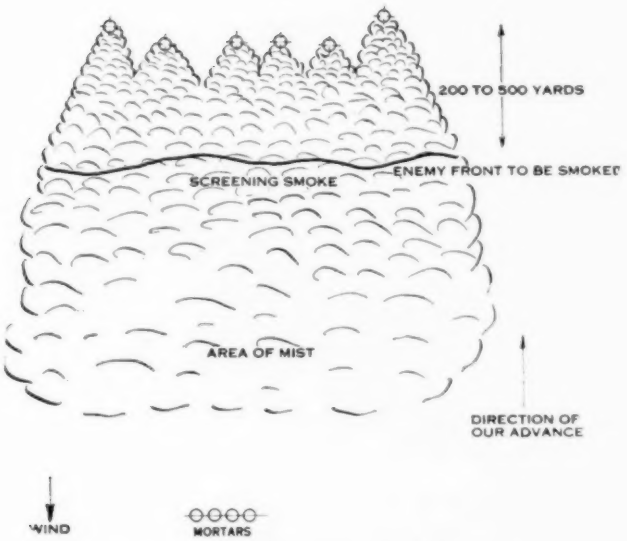


FIGURE 36.—Screening with a head wind.

SCREENING WITH A HEAD (12 O'CLOCK) WIND

Place center of impact in rear of the target. When firing to screen attacking troops, the smoke, upon crossing the hostile forward elements, should thin out to a mist.

SCREENING WITH A QUARTERING (OBLIQUE) WIND

For wind directions indicated by the arrows numbered 1 or 2, fire as in the case of a following wind, using somewhat less ammunition.

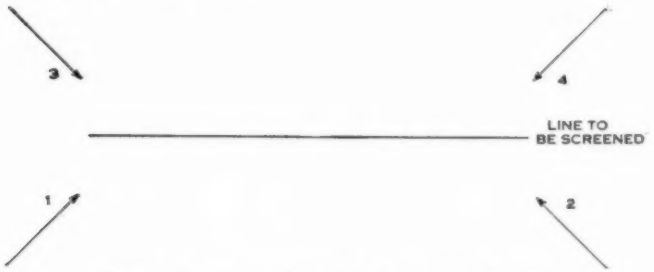


FIGURE 37.—Screening with a quartering wind.

For wind directions indicated by the arrows numbered 3 and 4, fire as in the case of a head wind.

SCREENING WITH SMOKE POTS OR CANDLES

The smoke cloud from a single smoke pot or candle is effective for 200 to 300 yards downwind of the munition.

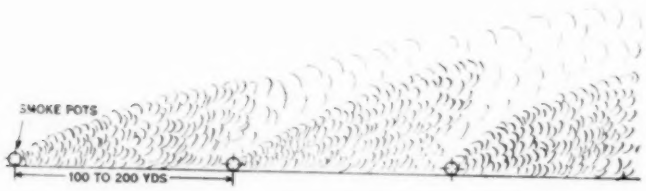


FIGURE 38.—Smoke pot screening with a lateral wind.

Thus the greatest economy or ammunition is had when the wind is parallel to the line to be screened.

SCREENING WITH A FOLLOWING WIND

Place smoke pots on line at 50-yard intervals and keep three burning at each point for the time the screen is required. Clouds from adjacent munitions will merge about 300 yards downwind.

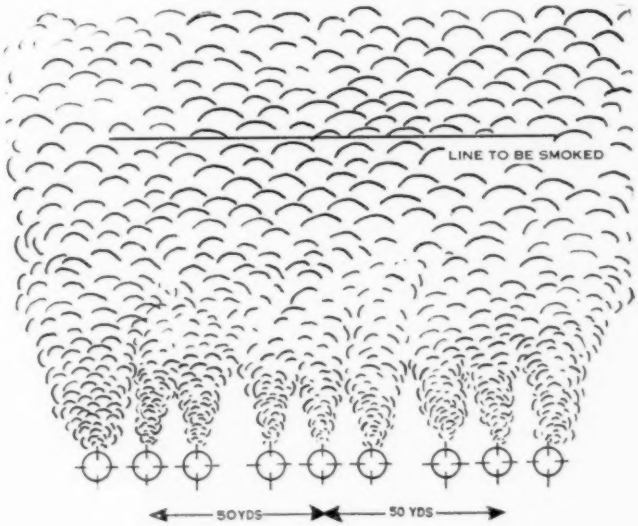


FIGURE 39.—Smoke pot screening with a following wind.

MULTIPLE EMPLACEMENT

When it is impracticable to have men set off more smoke pots or candles, as those placed initially burn out, a screen of considerable duration may be prepared at one time by placing two or more munitions together end to end so that as one burns out, the heat from it will ignite the next one.

As No. 1 burns down its heat ignites No. 2, etc.

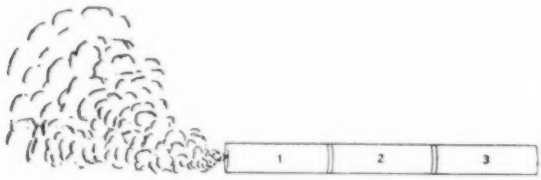


FIGURE 40.—Smoke pots laid end to end.

When there is danger of starting grass or brush fires the smoke pots or candles should be placed in holes in the ground 12 inches deep, or an area six feet in diameter about each munition should be skinned off.

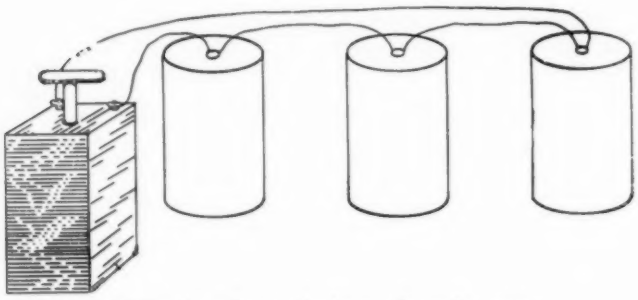


FIGURE 41.—Group ignition of smoke pots.

GROUP IGNITION

A number of candles or smoke pots may be wired together and ignited simultaneously by an electric current, using electric squibs for ignition.

TACTICAL EMPLOYMENT OF SMOKE

"Smoke is primarily employed as a means of blinding hostile observation. The basic condition for its use is, that while screening our own dispositions and movements from hostile view it must not impede our own observation or adversely affect the control of commanders over their troops. The employment of smoke must, therefore, be closely limited in respect to both space and time. Smoke screens that cannot be localized may have adverse effects that cannot be foreseen; the generalized employment of smoke over an extended section of the battlefield is seldom advantageous. Subject to these conditions, smoke may be employd to protect the flanks of an attack, to blind hostile observation posts, airplanes, centers of resistance, to conceal the approach of tanks, to cover a withdrawal, or to screen a counterattack." FSR, paragraph 423.

In all smoke operations with projectiles in support of attacking troops, observation of the cloud from the attacker's position is essential. Where the fire of smoke shell must be coordinated with the advance of friendly troops, the officer controlling the fire should also be able to observe the advance. If such observation is not possible, the fire must be regulated on a time schedule or upon prearranged signals from the advancing troops.

Smoke invariably attracts attention to the area of its use. Variation in the manner of using smoke is therefore indicated. Screens put down simultaneously or successively on different portions of the hostile position may deceive the enemy as to where the main attack is to be made. When sufficient means are available it is desirable to place smoke on the front of the holding attack.

Smoke lends itself to the art of ruse. For instance, it may be employed several times on an area before an attack is finally made, thus causing the enemy to relax his vigilance, and eventually be taken by surprise.

Smoke may be used to mask a gas attack. The use of gas and smoke on some targets and smoke alone on others may

so confuse a defender as to cause him to extend his gas-protective measures far beyond actual necessities.

Because it will attract attention white phosphorous shell may sometimes be used at night to divert attention from an area where a night attack is being made.

Other uses of smoke for deceptive purposes are to hide the flash of guns, or to conceal movement or maneuver.

MISSIONS

Smoke missions which are planned in advance should be calculated and provided for on the basis of adverse wind conditions obtaining at the time the operation is to take place. This is for the reason that local variations in wind direction can seldom be predicted with accuracy.

In smoke operations by chemical troops using 4.2-inch chemical mortars, the platoon with four mortars is the fire unit. The maximum frontage that the chemical platoon can screen, under adverse wind conditions, is 800 yards. Usually, the chemical platoon should be given but one mission to perform at a time. When smoke is desired simultaneously on two widely separated areas, two chemical platoons should be employed, one for each area. In exceptional cases, where both areas are small, where both can be observed from one observation point and fired upon from the same mortar position, one chemical platoon may be able to execute both missions at the same time, using two mortars on each mission.

The following examples illustrate the principal uses of smoke to aid attacking infantry.

TO FACILITATE THE ADVANCE OF FOOT TROOPS BY BLANKETING HOSTILE FORWARD POSITIONS

Smoke is established and maintained on hostile forward positions from the time attacking foot troops emerge from concealment until fire is masked by their advance.

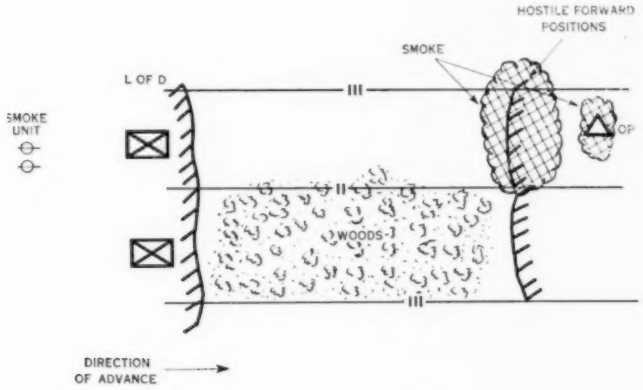


FIGURE 42.—Blanketing hostile forward positions.

(Means: Chemical mortars or other weapons firing smoke projectiles.)

After the first hostile position is taken, smoke may be employed in like manner against successive objectives.

In the assignment of smoke support missions, priority should usually be given to infantry units of the main attack whose zones of action are most deficient in natural concealment.

Where the use of smoke will affect an adjacent friendly unit, the smoke operation should be coordinated with that unit.

TO ENABLE TROOPS TO PASS BY AN AREA OF HOSTILE RESISTANCE OR ATTACK IT FROM FLANK AND REAR

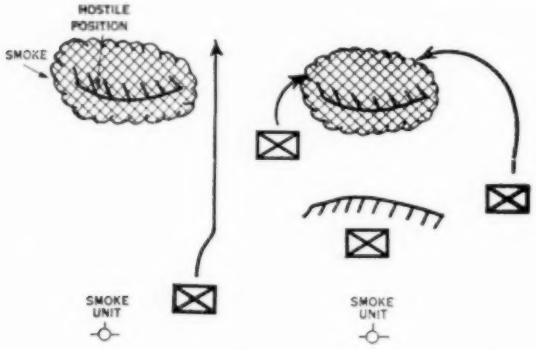


FIGURE 43.—Permitting troops to pass by hostile resistance.

TO BLIND HOSTILE OBSERVATION POINTS

To conserve ammunition, fire is limited to critical periods of the action.

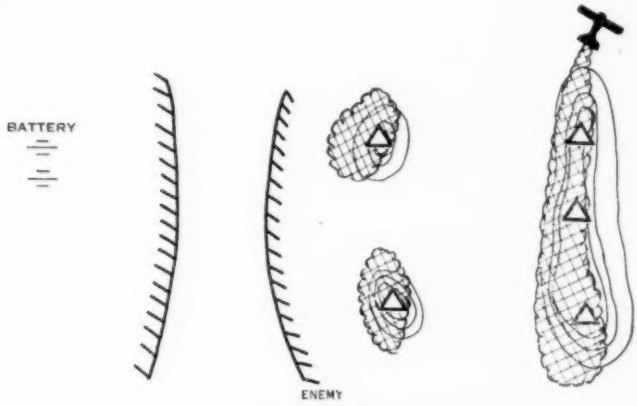


FIGURE 44.—Blinding hostile observation points.

(Means: Projectiles or airplane smoke.)

Prominent points may be covered, but to blanket a long ridge with smoke projectiles requires too great an expenditure of ammunition unless the wind direction is parallel to the ridge. At times, when a long screen is required for a short period of time, it may be practicable to employ airplanes to lay the smoke. Airplanes, however, all factors considered, are the least suitable means of smoke laying for the infantry and should be employed only in exceptional cases.

FIGURE 45.—Airplane laying smoke screen.

TO PROTECT TROOPS HALTED FOR THE PURPOSE OF REORGANIZATION

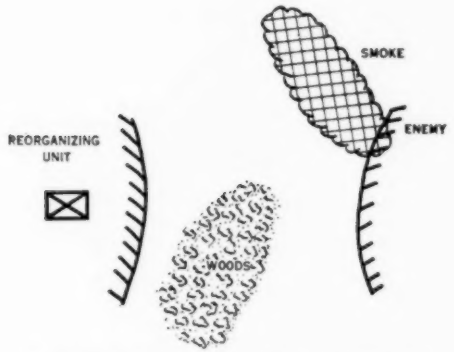


FIGURE 46.—Protecting reorganization.

(Means: Smoke projectiles or candles.)

Smoke is placed forward, or on the flank of the position of the reorganizing troops if necessary to conceal them. When the screen is placed close to our troops, care must be taken lest the enemy make use of such smoke to launch a counterattack.

TO PROTECT AGAINST ENFILADE FIRE

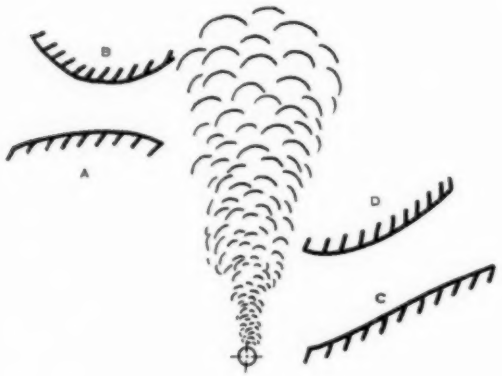


FIGURE 47.—Protection against enfilade fire.

(Means: Smoke pots, candles, or mortars.)

Force A, engaged with hostile force B, and receiving flank fire from hostile force D, employs smoke for flank protection as shown in the sketch. If the wind will blow smoke toward A the concentration should be light; if toward friendly force C, smoke should not be used.

TO CONCEAL DAYLIGHT MOVEMENT OF TANKS WITHIN OUR OWN POSITION

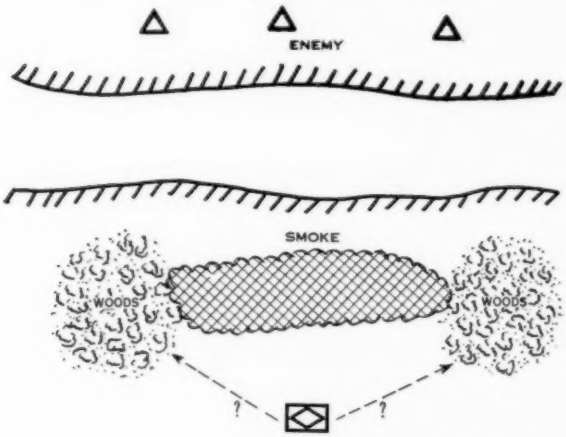


FIGURE 48.—Concealing daylight movement of tanks.

(Means: Smoke pots, candles, or airplane smoke.)

The above diagram illustrates a case where smoke might be used to prevent an enemy from learning which area will be used by our tanks for their assault position.

TO PROTECT TANKS DURING AN ATTACK AND WITHDRAWAL TO ASSEMBLY POINT

Smoke is employed on the flanks of the zone of attack to blind known or suspected positions of hostile antitank guns and artillery observation posts. Whenever possible, similar screens are put down at other places on the hostile front to deceive the enemy as to the point of attack.

The placing of smoke is begun at such time as will insure the establishment of an effective screen just before the tanks emerge from natural concealment. If practicable, the screen is maintained throughout the attack and until the tanks withdraw to their assembly point. Smoke for this purpose is usually laid by means of projectiles. Airplanes may be used in exceptional cases.

"SMOKE CAGE" OR "CLOSED FIELD" METHOD

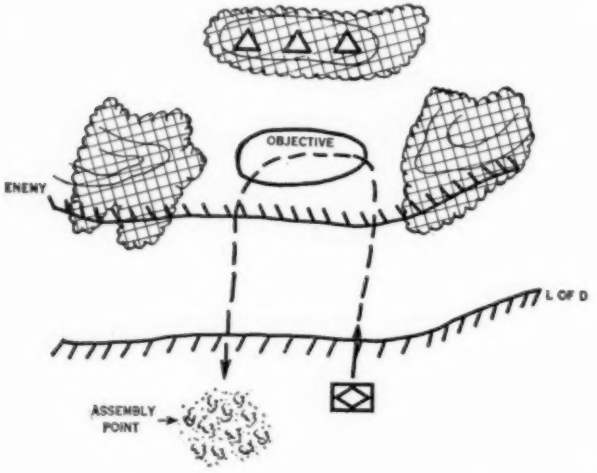


FIGURE 49.—"Smoke cage" screening.

In this case the zone of attack is screened from observation of all hostile ground elements except those within or forward of the tank objective. Against the latter, neutralization fire other than smoke is used.

SMOKE ON THE TANK OBJECTIVE

This method has the advantage of maximum smoke protection for the tanks and considerable protection for the foot troops following. Fire of smoke on the objective must cease in time for that area to be clear of smoke when the tanks reach assaulting distance. The officer controlling the

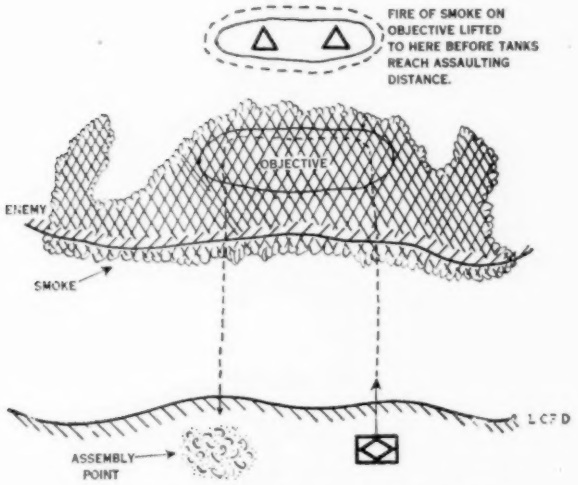


FIGURE 50.—Placing smoke on the tank objective.

fire of the smoke, therefore, should be able to observe the movement of the tanks and the objective. This method should be considered when—

1. Available supporting fires other than smoke are insufficient to neutralize the objective.

2. The tanks must move for a considerable distance over exposed ground.

SPECIAL USES

ATTACK OF A RIVER LINE

To deceive the enemy as to the actual point of crossing, smoke is used on a broad front at the water's edge, covering the various suitable crossing points, and is also placed upon hostile observation points.

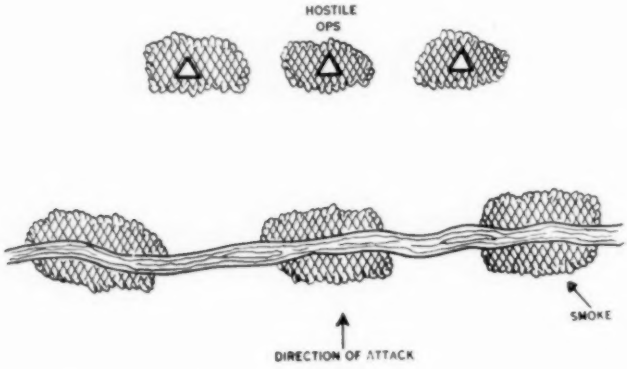


FIGURE 51.—Use of smoke in attacking river line.

Smoke projectiles are normally used for this purpose. At times smoke may be laid by airplanes. Smoke candles or smoke pots can be used from the attacker's side of the river when the wind is blowing toward the enemy side.

LANDING ON HOSTILE SHORE

Smoke from airplanes or ships' batteries is employed to deceive the enemy as to the point of landing, and to screen the approach of the small boats.

After a landing is made, smoke is used as in other attacks on land.

USE OF SMOKE IN DEFENSE

In defense, the employment of smoke must be limited, in general, so as not to obscure the defenders' field of fire. This limitation largely confines the use of smoke to blinding hostile rearward observation points. The following exceptions to this rule are noteworthy:

1. *Use of smoke in counterattack.*

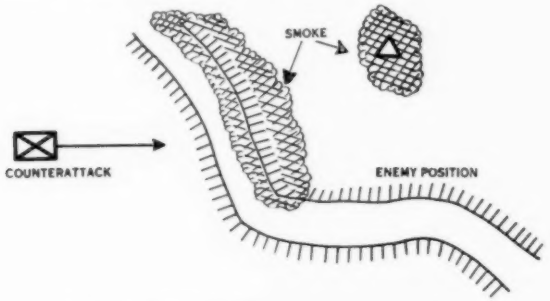


FIGURE 52.—Using smoke in counterattack.

Smoke has been placed on the hostile position to screen the advance of the counterattacking force.

2. *To delay or disrupt a hostile tank movement.*

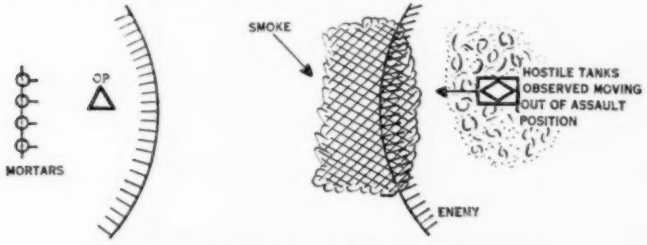


FIGURE 53.—Placing smoke on hostile tanks.

Sometimes it may be advantageous for a defender to cover approaching hostile tanks with smoke, to retard or disrupt their movement, thus gaining time for the emplacement and sighting of antitank guns before the smoke is dissipated.

3. *Use of WP shell in limited quantity for casualty effect on hostile forward elements.*—In this case the firing frequently can be so spaced in time as to prevent the formation of a large smoke cloud. Such fires are generally practicable when the wind is blowing from the defender toward the attacker.

To insure proper coordination in the use of smoke in defense, smoke operations must be carefully controlled. This may be effected by designating a line short of which subordinate units are not to use smoke without higher authority, or by retaining the smoke means under centralized control.

SCREENING A DAYLIGHT WITHDRAWAL

Smoke is of great value in enabling troops to break contact during daylight and withdraw from action. It will seldom be feasible or necessary in withdrawals to put down smoke across the entire front. Smoke support, therefore, should be limited to those units whose routes of withdrawal are the most exposed to hostile observation and fire. Smoke is placed, in so far as practicable, upon the foremost hostile elements so as to interpose the screen between the enemy and the withdrawing troops. The screen is maintained for a sufficient time to enable forward friendly elements to break contact. Thereafter additional screens in successive positions to the rear are laid as necessary. It is desirable to employ smoke projectiles in establishing such screens, at least for those put down initially. Where the opposing forces are in close contact, however, it may often be impracticable to fire the smoke so as to cover the foremost hostile elements. In such cases, static smoke-producing munitions, such as smoke pots or candles, may be used to advantage by forward foot troops to supplement the screen put down by projectiles. Static smoke munitions are also useful for establishing successive smoke screens to the rear and across the routes of withdrawal. The following illustration shows a method of combining the use of smoke projectiles and static munitions in screening a withdrawal.

SCREENING A DAYLIGHT WITHDRAWAL FROM ACTION

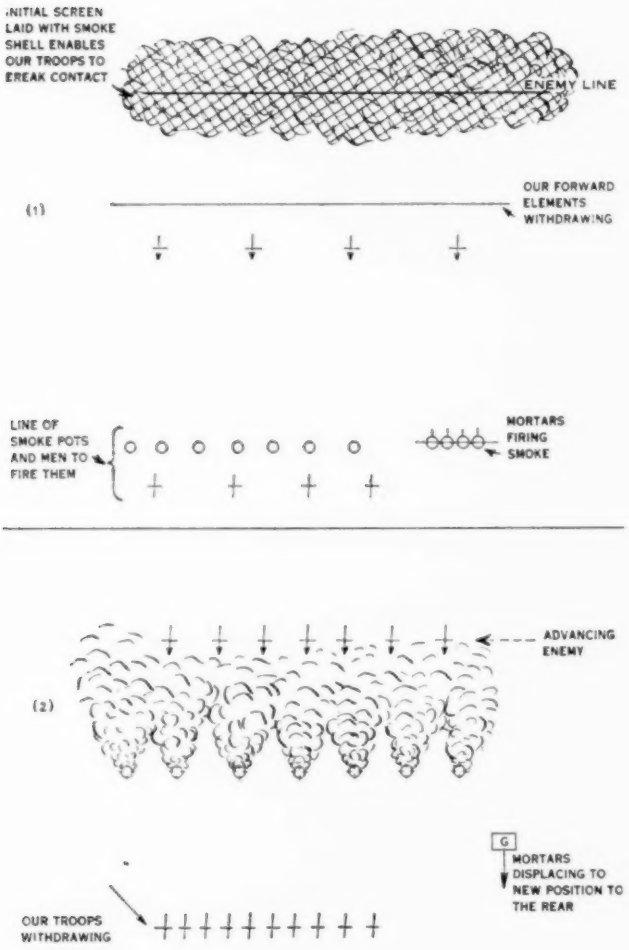

INITIAL SCREEN LAID WITH SMOKE SHELL ENABLES OUR TROOPS TO BREAK CONTACT
ENEMY LINE
(1)
OUR FORWARD ELEMENTS WITHDRAWING
LINE OF SMOKE POTS AND MEN TO FIRE THEM
MORTARS FIRING SMOKE
(2)
ADVANCING ENEMY
G
MORTARS DISPLACING TO NEW POSITION TO THE REAR
OUR TROOPS WITHDRAWING

FIGURE 54.—Screening daylight withdrawal.

CHAPTER 5

Sand Table

(INFANTRY SCHOOL STUDY)

The purpose in presenting this chapter is to demonstrate that the sand table, properly used, offers to instructors an effective technique in teaching certain military subjects. It will be found an invaluable aid in teaching map reading, scouting and patrolling, musketry, field engineering, terrain appreciation, machine-gun direct and indirect laying, and combat principles. All of these subjects are easily adaptable to sand table methods. Particularly does the sand table lend itself to the teaching of combat principles. In that regard it has many advantages. One can always get the type of terrain one desires, the table is always available, and weather conditions never interfere. It develops the eye for terrain for which General Lee was so renowned. All terrain features and troop dispositions can be seen in their relative importance. Time and space factors become readily apparent. The student is not confused by the closeness of geographical features as in the field. He sees the entire landscape and can quickly pick out those features essential to the solving of a problem.

Since all this is true, could we not profit by learning to use the sand table and by becoming familiar with its capabilities? Experience has proven that the cost of materials for the construction of a sand table is small, that the time required to prepare the sand is short, and that sand table work is both simple and highly effective.

Because simplicity should be the dominant feature in constructing a sand table, it is a mistake to make an elaborate model and to work on this same model day after

day. The object to be aimed at is this: the sand table should look definitely like a piece of terrain, but should take no longer than one or two hours to construct.

There are various kinds of sand tables, any one of which will suit the purpose. A tray, six feet long by four feet wide and six inches deep, has many advantages, even though suited for small problems only. It is easy to make, costs little, and presents no difficulties in moving and setting up. The sand table that you see in Figure 55 was constructed of wood and is ten feet long by five feet wide, and ten inches deep. It cost approximately eight dollars. It is a large table and can be used, not only for small problems involving squads, platoons, and companies, but also for problems involving units the size of a regiment. It is filled with sand obtained from local sources.

TECHNIQUE OF CONSTRUCTION

The first step is to build a tray or box and fill it with sand. Any kind of sand, capable of being molded when wet, will suffice. It would be a good idea to have on hand also, as a reserve, extra sacks of the same sand. There are certain other materials required to enable one to work with the sand. They are: a shovel, a rake, a sprinkling can, a ruler, a GI can for water, a bucket for mixing sand with water, string, thumb tacks, blue and green colored chalk, road rollers, a small wire sieve for powdering chalk, and assorted sizes of wooden blocks to be used in representing houses, small towns, and troop dispositions.

FIGURE 55.—Sand table.

Figure 56 represents the map we desire to reproduce on the sand table. Looking at that figure, we see that it is divided into squares, which have been numbered and lettered. Our first problem, then, is to decide how much of the sand table we shall use in reproducing the map. Observe that the map is square, and recall that the sand table is five feet wide by ten feet long. It immediately suggests that we use one-half of the sand table. The map has been divided horizontally and vertically into 25 squares. Figure 57 shows this sand table divided into 25 squares, each of which is one square foot. Each square on the map will then represent one square foot on the sand table. To so divide the sand table will take about five minutes. Before we begin molding the sand to conform to our map, we must decide on a datum plane and the vertical interval we intend to use. That is, shall we make all measurements of vertical intervals from the bottom of the sand table, or from the top of the sand table? How many feet will one vertical inch on the sand table represent on the map? This is a simple problem. Suppose we approach it in this manner: Let us begin our measurements from the top of the sand table; then, in order to obtain an accurate measurement, we will not have to dig out sand and disturb anything we may later build—as would be the case had we used the bottom of the table for our datum plane. The highest point on the map is in the lower right-hand corner and the contour shows its elevation to be slightly more than 240 feet. The lowest point on the map, about 60 feet, is on the stream bed. We therefore have a difference of 180 feet between the highest and lowest points. If we use six inches on the sand table to represent this 180 feet, we will have one inch on the sand table representing 30 feet vertical distance on the map. Then the area represented in the lower right-hand corner of the map will be built level with the top of the sand table and the stream bed will be six inches below the top of the sand table. In order to determine the height of any point on the sand table, we have merely to place a straight edge across the top of the table, then place a ruler against this straight edge and measure down the desired

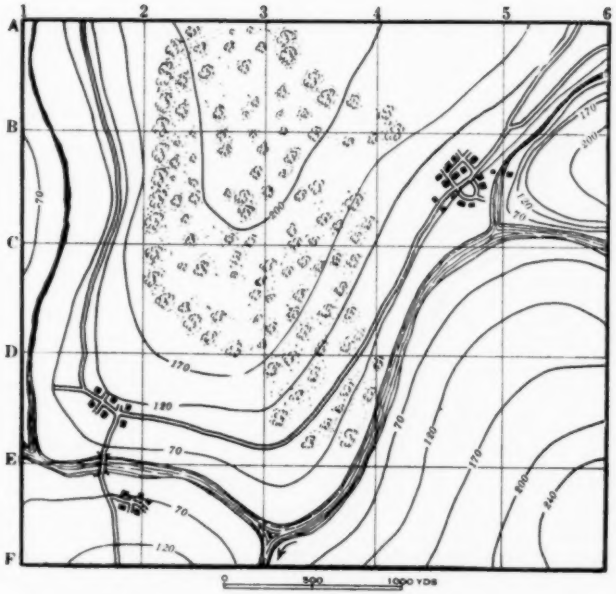


FIGURE 56.—Map to be reproduced on sand table.

number of inches. This number can be determined readily. Pick out a point on the 150-foot contour. The difference between the elevation of this point and the highest point on the map will be 90 feet. We know that the vertical interval on the sand table is one inch equals 30 feet. Hence the elevation of this point on the sand table will be three inches below the top of the table. It is also a simple matter to determine the horizontal scale. The map is 3,300 yards wide. It is to be reproduced on one-half of the sand table; that is, in a sand area of five feet on each side. Therefore, each linear foot on the sand table will represent 660 yards on the map. The instructor should emphasize this point, for it will be necessary for the student to know the horizontal scale in order to appreciate time and space factors and to understand the dispositions of the units which are later to be placed on the sand table. When we have determined the horizontal and vertical scale and decided on the datum plane, we are ready to begin the actual construction.

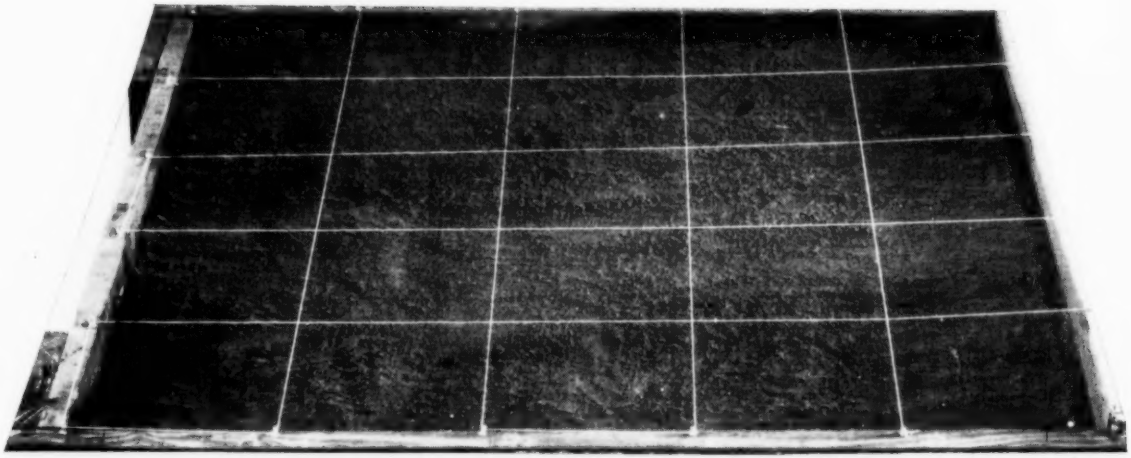


FIGURE 57.—Sand table divided into squares to correspond with map. (*Note*.—In Figures 57, 58, 59, 60, 61, and 63, which follow, only one-half of the sand table is shown in the figure.)

Our first step is to outline the most prominent geographical feature—in this case the stream bed. This is done by tracing in the sand, with the fingers, the outline of the stream bed. (See Figure 58.) This should take about one minute.

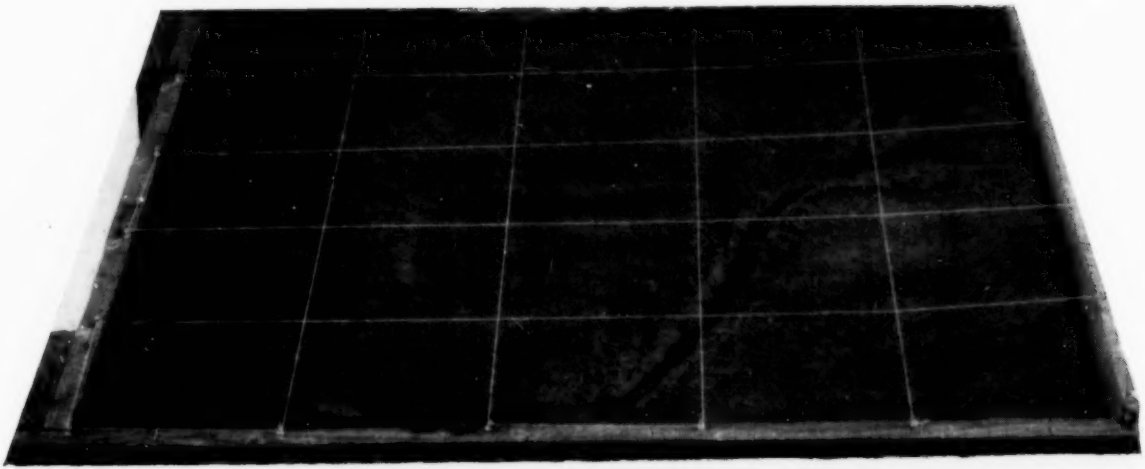


FIGURE 58.—Stream bed outlined in the sand.

Our next step is to outline similarly the principal contours. In Figure 59 a 120-foot, a 170-foot, and a 240-foot contour have been outlined. This should take not longer than five minutes.

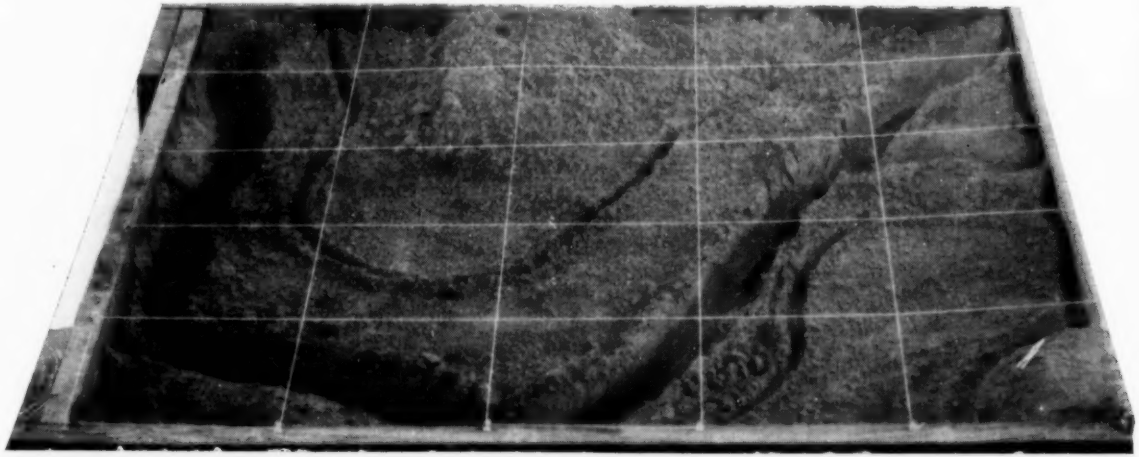


FIGURE 59.—Principal contours outlined and molding begun.

We are now ready to begin molding the sand. In doing this, care should be taken to bring the ground forms out clearly. This is not a painstaking, tedious job. It can be done rapidly. It is not necessary that every portion of the sand table be accurate to a fraction of an inch. It is only necessary that the ground forms be correct in general. (See Figure 60.) This molding should take about 30 minutes.

FIGURE 60.—Molding partly completed.

The terrain features are now beginning to assume definite shapes. The sand table begins to look like the map; there is no reason why it shouldn't. (See Figure 61.) In this figure, we have completed all of our ground forms. Next we use a piece of paper to smooth out the inequalities of the sand. (Sprinkling water over the sand with the sprinkling can will secure much the same results.)

On Figure 61 you will observe that one-half of the sand has been so smoothed. The other half has been left rough in order to show clearly the difference between the smooth and the untouched parts. When the molding of the sand has reached this stage, the work is almost completed.

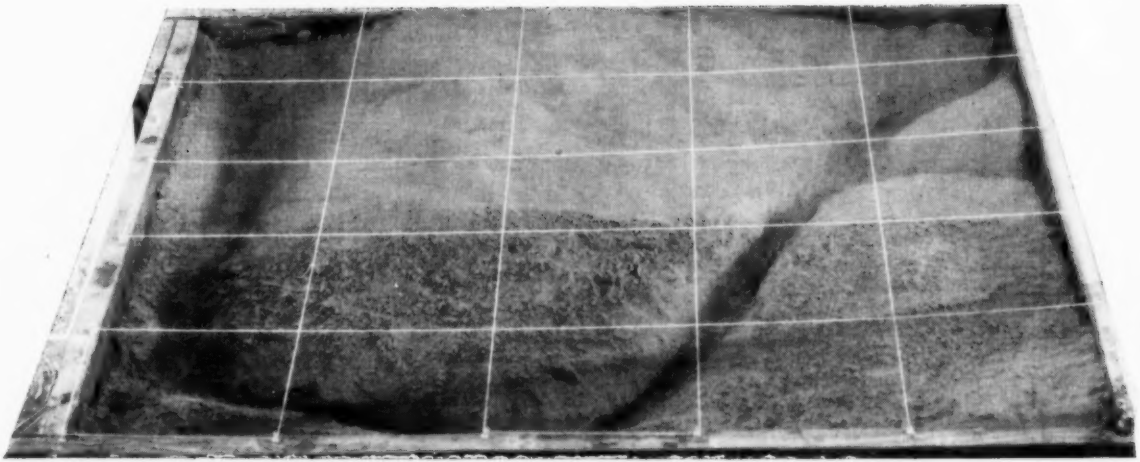


FIGURE 61.—Molding completed. Half of sand smoothed with paper.

Next line off the prominent roads. Rollers of the type shown in Figure 62 can be used for this purpose. Then drop in the woods. To do this, drop small handfuls of wet sand on the table in their proper places. Color the woods with powdered green chalk; outline the stream with powdered

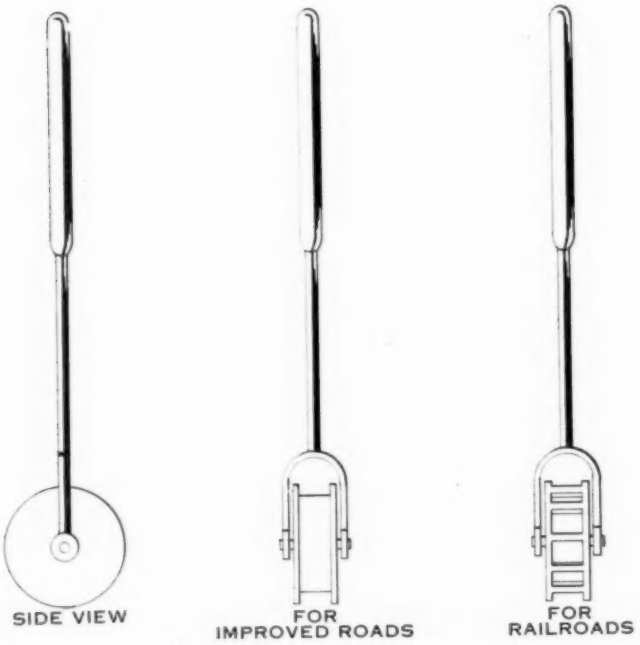


FIGURE 62.—Types of rollers.

blue chalk. Powder the chalk by rubbing over a small wire sieve. Use the wooden blocks to indicate the villages; place in the bridges, take off the string, and the table is finished. (See Figure 63.) The whole construction should take no longer than an hour.

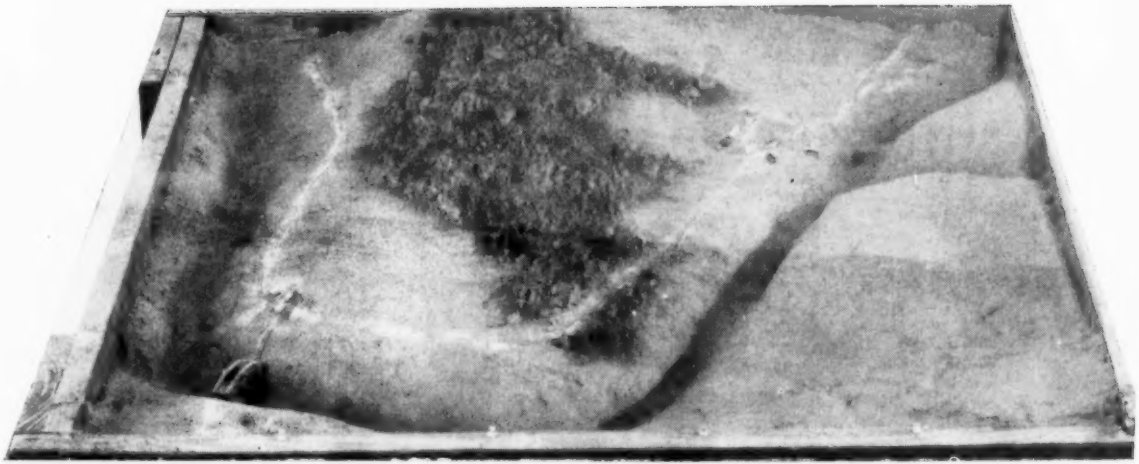


FIGURE 63.—Completed sand table.

This method of making a sand table is simple, rapid, and produces all the desired results. One demonstration of this method should be sufficient to permit the noncommissioned officers of a unit to grasp the simple technical requirements and enable them to prepare all sand tables to be used by their organization in the future.

Should you construct the sand table as shown in Figure 63, you will find in Chapter 3, Volume VIII, of The Mailing List some historical problems for small units ready for your use. There are many situations in "Infantry in Battle", "The Infantry Battalion in War", and The Mailing List suitable for use on the sand table. It is desirable to use historical problems to illustrate tactical principles. They are alive. Once the men know that the situations are real and that other men have actually lived through them, they become extremely interested, particularly so when the historical solutions are presented and discussed.

There are other methods of making a sand table, more painstaking and meticulous. One other is now described for the purpose of illustrating the difference in the technique of construction.

Figure 64 represents the ground we desire to portray. An examination of the map will show that it is twice as long as it is wide. Consequently, we will decide to use the entire sand table, which you will recall is also twice as long as it is wide. We will follow, up to a certain point, the same procedure as before. Divide the map into 50 squares, and then divide the sand table into 50 similar squares. The horizontal and vertical scales are determined as previously explained. In this case, however, we decide that one inch on the sand table will represent a vertical interval of 15 feet on the map. This is done because the difference between the low and high points is 120 feet and should we use 30 feet to an inch as our vertical interval we will not obtain sufficient depth to make realistic terrain. A little experience will soon give one facility in determining appropriate vertical intervals.

We will now pick out the critical points we desire to use and determine their elevation. These critical points will be the crests of the hills, stream junctions, and important points on the main ridge lines. They are selected by inspection. The highest and the lowest points on the map, which we have already determined, are examples of suitable critical points. Once the locations of the critical points and their elevations have been determined, we force into the sand a small stake for each critical point. In order to determine the height of any critical point on the sand table, we place a straight edge across the top of the table and with our ruler measure down from the straight edge to the top of the stake, as we have previously explained. The stake is moved up or down until its top is at the desired height. When all of the critical points have been established we shape the table according to the position of the stakes in the sand, and the contours on the map. Then we mold the sand as we did in the first case. This method is considerably more in detail than the one first described and will produce more accurate results. The slight increase in accuracy usually will not justify the additional time expended. Figure 65 shows the sand table reproduction of the map shown in Figure 64.

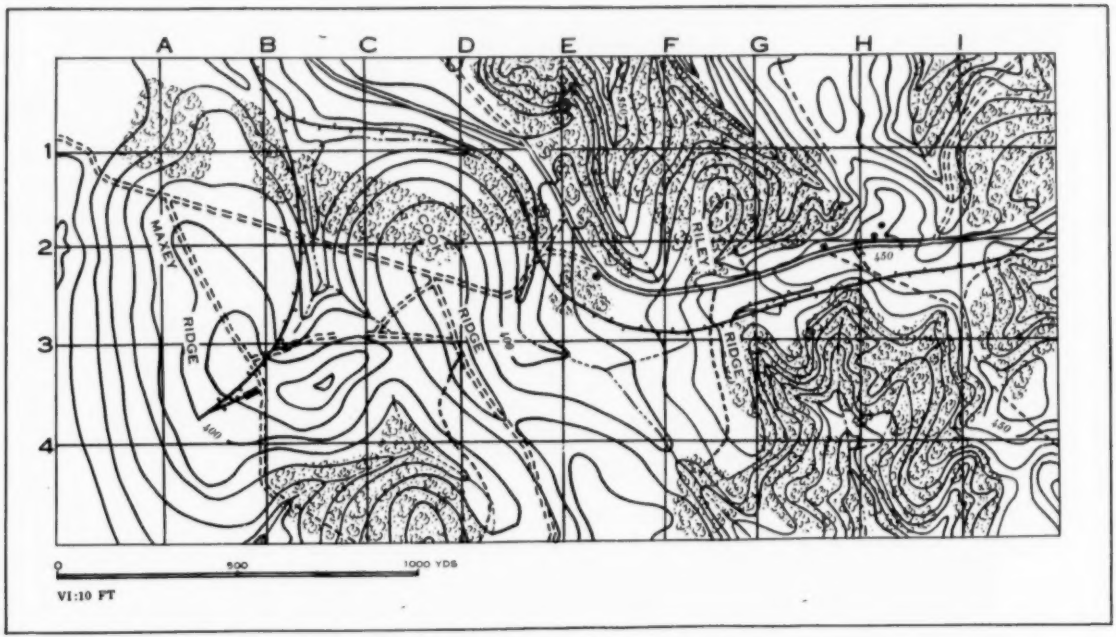


FIGURE 64.—Map to be reproduced.

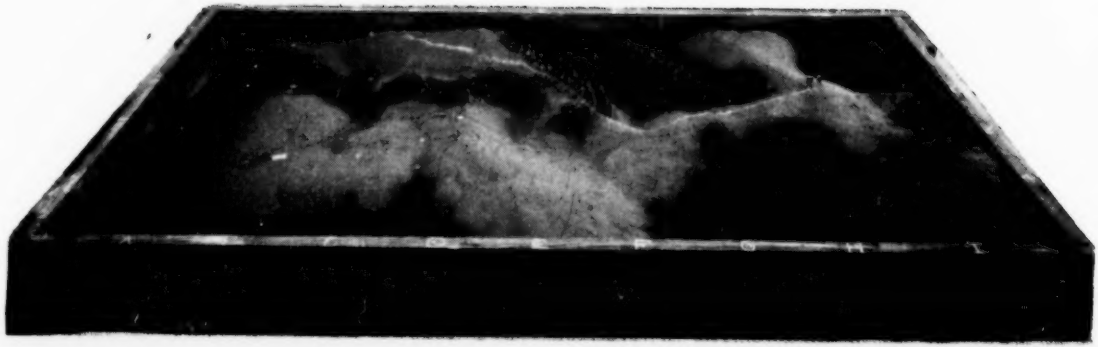


FIGURE 65.—Sand table prepared for tactical problem.

TRAINING USES OF THE SAND TABLE

Let us suppose that the instructor has decided upon the problem he is going to use and that a detail of noncommissioned officers of the unit have made a sand table suitable for the problem. In this case we will assume that the desired table is the one shown in Figure 65. The class is assembled around the table. What is the best way for the instructor to put the problem over?

Take a few minutes to discuss the ground which the class is observing. Explain the horizontal and vertical scales and point out the important terrain features. Ask a few questions to be sure the class understands the terrain. Then briefly state the tactical situation. Allow a few minutes for studying the situation and then have all members of the class write their decisions on paper. Call upon one student for his solution and discuss it. Ask for other solutions. Discuss them also. When a phase of the problem has been covered to your satisfaction, proceed to the next situation. In this way interest is stimulated. Moreover, each man must think because he is required to put his thoughts on paper. There will be no hopeful waiting for the instructor to call on someone else. There will be few lazy answers such as "I agree".

Let us take an example, using for our purpose the ground represented in Figure 65. Any logical situation will serve. In this case, we desire to give training in making a tactical decision. We could announce the situation as follows:

"Your company, an exterior unit on the left flank, is attacking in a northwesterly direction with two platoons in assault. You are the leader of the left assault platoon. Your platoon is attacking generally along the First Division Road. Formation: column of sections, echeloned to the left rear." (See Figure 66.)

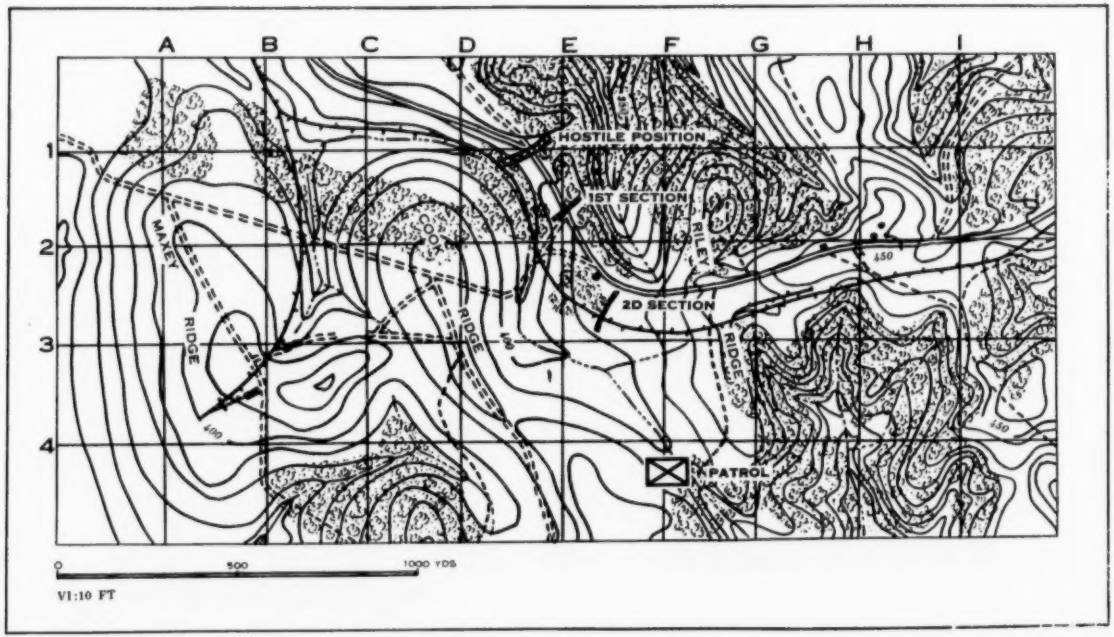


FIGURE 66.—Sketch of tactical dispositions.

Here place pieces of wood on the sand table to represent the platoon and point it out to the class. Be sure that they understand the direction of attack and that each man understands he is the leader of the left assault platoon. To continue with the situation:

"You know that the left of the platoon on your right is about 200 yards to the right of your platoon. A left flank patrol from the support platoon has just disappeared into the woods, about 750 yards to your left rear. Your platoon is located as you now see it. Your leading section is pinned to the ground by rifle and machine-gun fire from the hostile position. Your rear section is under cover about 200 yards to the rear of the leading section."

The instructor should ask a few questions to be sure the class understands the situation. He is then ready for the first requirement.

FIRST REQUIREMENT.—Your decision at this time. It should answer the questions: What? Where? When? How? Why?

Require all members of the class to write their decision. Call for the decisions of several members of the class. Invite free discussion.

After the discussion the instructor can give what he considers a reasonable solution or solutions. In this case, a solution might be as follows:

The platoon commander decides to maneuver the second section at once to the high ground on the left by a covered route, in order to outflank the resistance in front of the first section.

To illustrate the principles involved, pertinent extracts from Field Service Regulations can be quoted. In this case, paragraph 48, FSR:

"Infantry has two general means of action: Fire and movement. Infantry fights by combining these two means of action.

"Fire constitutes its principal means of destruction. Fire is also one of its principal means of neutralization. Through

the destructive and neutralization effects of its fire, infantry assists in creating conditions that facilitate its own movement and check the movements of the enemy."

Here we have all the essentials for a good tactical lesson: a reasonable situation, a decision by the student, a thorough discussion and explanation, and a reference to the basic principles involved. This method, you can rest assured, will get results. It is sound procedure. Perhaps a word of warning is appropriate here. Although the sand table is an invaluable aid in teaching the tactics of small units, it should never be used as a substitute for work on the ground. An ideal method is to cover the problem on the sand table first, and then cover the same problem on the actual ground.

TERRAIN APPRECIATION

We stated at the outset of this chapter that the sand table could be used for instruction in many military subjects. Terrain appreciation is one of those subjects which readily adapt themselves to sand table instruction. The ultimate purpose of map and aerial photograph reading is not merely visualization of terrain features, but also appreciation of their fitness for some particular military purpose. This is known as terrain appreciation. We will endeavor to show the uses of the sand table in this regard.

In all tactical situations, particularly with small units, terrain plays an important part. Frequently, the terrain exercises almost a tyrannical authority over the tactical dispositions. Terrain is always a factor, and often the most important factor in determining what plans of action are possible for our own forces. In order to utilize terrain to the greatest advantage, it must be understood. In order to understand it, it must be studied. In this study one of the simplest and most effective aids to terrain appreciation is to portray the terrain on a sand table.

Figure 67 is a map of a section of the Fort Benning Military Reservation. A detailed study of this map will reveal the hills, the ridge lines, and the drainage system. Let us take this section of a standard, fire control map and pick out the chief tactical localities; the best locations for observation posts and the important terrain corridors. Indicate on the map your choice of these features. Did you have any difficulty in doing this?

We know that the drainage lines and the ridge lines form the natural basis for the study of the topographical features. Take a blue pencil and emphasize on Figure 67 the stream lines, and then mark with a brown pencil the axes of the principal ridge lines. We now begin to visualize the terrain, as emphasizing these lines brings into prominence the low points and the high points and makes apparent their inter-relation.

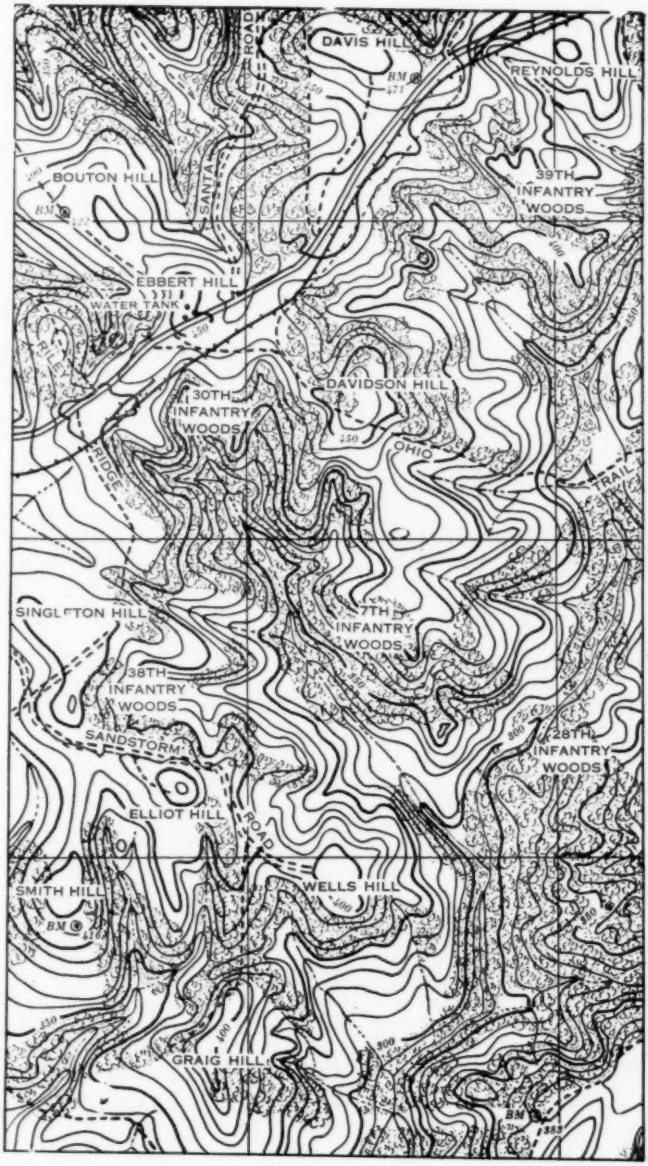


FIGURE 67.—Area for terrain study.

Look at Figure 68. This is a sketch of the same area showing the drainage and ridge lines. It shows the same lines that you have just emphasized on Figure 67. Note that each hill has been indicated by the first letter of the name of the hill. Does this figure give you a better understanding of the topographical features? Does it influence your original choices of the key positions?

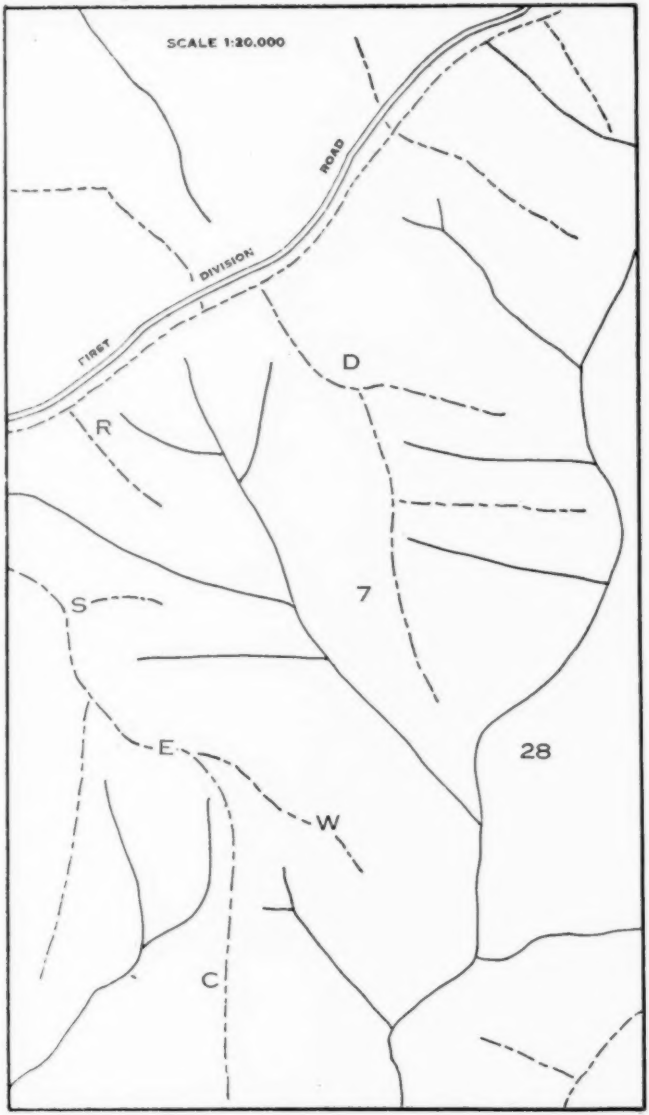


FIGURE 68.—Sketch of area showing drainage and ridge lines.

The following legend will be used for Figures 68, 69 and 70:

R—Riley Ridge.	C—Craig Hill.
E—Elliot Hill.	D—Davidson Hill.
W—Wells Hill.	7—7th Infantry Woods.
S—Singleton Hill.	28—28th Infantry Woods

As a further aid in this terrain study we should use an aerial photograph. Figure 69 shows an aerial photograph of the area with the stream lines indicated by heavy white lines. This photograph brings up to date the condition of roads, houses, woods and any other landscape changes that have taken place since the map was drawn. The hills are indicated by the first letter of the name of each hill. Does a study of this photograph assist you in making your terrain study of the area? Does it influence your original selection of the tactical localities and other key positions?

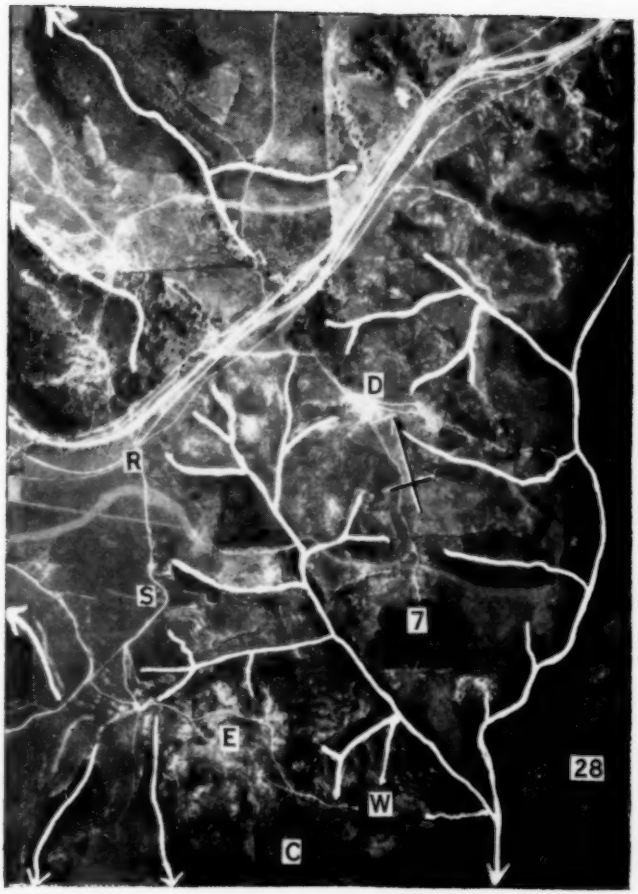


FIGURE 69.—Aerial photograph of area.

From the combined study of these three figures do you still have any difficulty in picking out the key tactical localities?

Now, look at Figure 70, which is a sand table representation of the same ground. The ridge lines and the drainage system become apparent immediately. The hill crests have been indicated as in the previous figures. The wooded areas, as found on the aerial photograph, have been shown. One of the terrain corridors has been indicated by the ribbons placed on the two central ridges. Cardboard circles have been placed on some of the tactical localities. An instructor can guide the attention of the students by placing the circles on those terrain features under discussion.

Is Figure 70 of any help in selecting observation points, terrain corridors, and the chief tactical localities? Do the ridges, hills, and stream lines stand out clearly? Are the terrain compartments clearly defined? Do you obtain a better appreciation of the terrain by a study of the sand table than by an equal time spent in studying the three previous figures? The answers are unmistakably YES.

Experience has shown that the sand table can be used satisfactorily as an examination in map reading. If the student can put on the sand table a reproduction of a map, then you are certain he understands map reading.

The sand table permits complete visual presentation of a subject. The objects are before the eye of the student. Nothing is left to the imagination. By advancing one idea at a time, the instructor follows the principle of association of ideas. Simplicity is the keynote. Because of the nature of the instruction on the sand table, the subjects taught usually prove interesting. The basic reason is that the sand table enables an instructor to take principles expressed in words and show their application by concrete examples.

The sand table proves over and over the truth of the old Chinese proverb, "One picture is worth a thousand words."

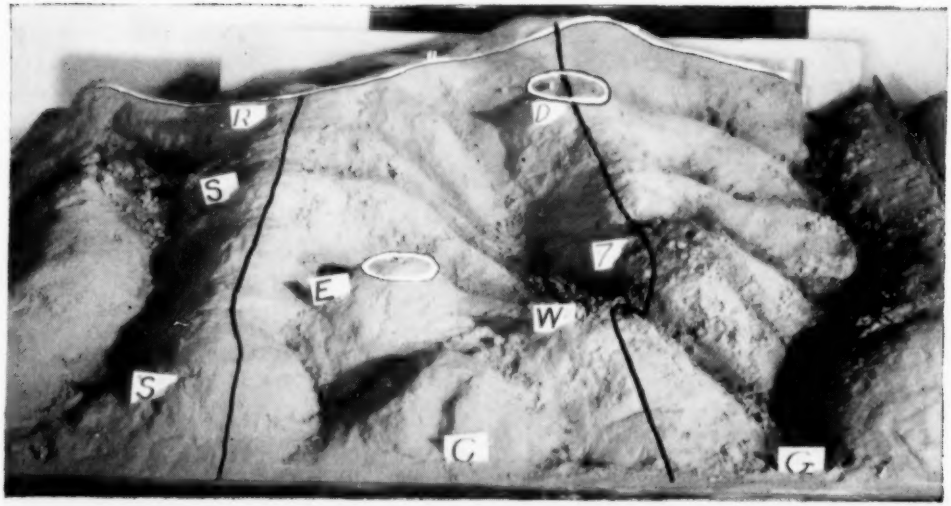


FIGURE 70.—Sand table representation of area.

CHAPTER 6

An 81-mm Mortar Platoon Supports An Attack

(INFANTRY SCHOOL TEACHING)

In the regimental organization taught this year at The Infantry School, the 81-mm mortars are grouped in a company of three platoons, one or more of which are placed in support of or attached to rifle battalions as the situation requires.

In the proposed reorganization of the infantry regiment the mortar platoon becomes an integral part of the battalion. This change in organization will necessitate no radical change in the combat principles of the mortar platoon. Its mission, the close support of the assaulting rifle companies, remains the same whether the mortar platoon is supporting, attached to, or actually a part of the battalion. It uses the same tools, two 81-mm mortars. What it is capable of accomplishing with these tools, and the extent to which it can contribute to the forward movement of the battalion, may be deduced from the following tactical exercise. As a matter of interest, this tactical exercise was fired at Fort Benning with high explosive and smoke shell. Consequently the statements as to the time factors involved and the results obtained are based on actual experience.

SITUATION

The 1st Battalion 29th Infantry, an interior battalion, is attacking east. Its zone of action, battalion observation

post, the location of its two assault companies and the battalion objective are shown on the operation sketch (see Figure 71). Heavy machine-gun fire from hostile combat groups 1 and 2 has stopped the advance. Units on the right and left are generally abreast of the 1st Battalion.

The battalion commanders scheme of maneuver, for the continuation of the attack, is to reduce Green Hill by advancing the right assault company east along the draw just south of the Ohio Road to the cover of the woods southwest of Green Hill; then to capture the hill by flanking action from the south. This maneuver will require the right assault company to cross the bald crest of the south nose of Davidson Hill under observation and fire from Green Hill and exposed to fire from enemy combat group 1, which is now sweeping the crest with machine-gun fire. This group is in the zone of action of the battalion on our left.

An 81-mm mortar platoon has just been attached to the 1st Battalion. It is assembled, off trucks, concealed by the trees on the west slope of Davidson Hill (see Figure 71). Its motor transport is halted, in a concealed position, near the road and railroad crossing on Riley Ridge. The platoon leader, accompanied by his section sergeant, agent corporal, and three runners, has reported to Lieutenant Colonel 1st Battalion at his OP on Davidson Hill; has been informed of the situation and battalion scheme of maneuver, and has received the following instructions from the battalion commander:

"I have arranged for cooperation by the supporting weapons of the battalion on our left. Select a position in this area. I want you to neutralize the hostile combat group at 1, then to blind the hostile observation on Green Hill until our right assault company crosses that ridge (south nose of Davidson Hill). When the company has crossed the exposed ridge, concentrate with high explosive on the combat group at 2 in order to assist in the capture of Green Hill. It is now 10:05 AM and we will attack as soon as you are in position to support us. Let me know when you will be ready to fire."

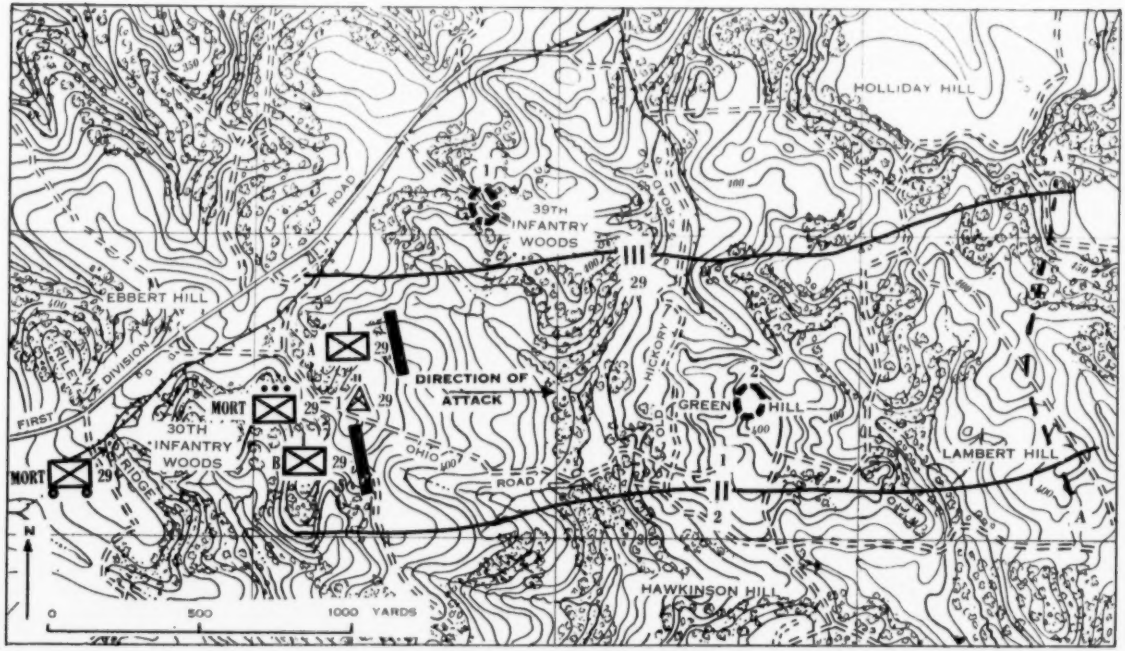


FIGURE 71.—Operation Sketch 1st Battalion 29th Infantry.

Lieutenant Mortar Platoon is now aware of the following factors which will influence his actions and decisions:

His initial mission is to support the attack by neutralizing the hostile combat group at 1, by blinding the hostile observation from Green Hill, and by neutralizing the hostile combat group at 2. Each of the hostile combat groups appear to cover an area of about 200 yards in width by 100 yards in depth. High explosive shell will be used for neutralization and smoke shell will be used for blinding the hostile observation.

His platoon, detrucked, is in a concealed assembly position about 400 yards west of Davidson Hill. Each mortar squad is carrying by hand its weapon, equipment, and 18 rounds of light shell. The ammunition squad is with the platoon and is carrying 36 rounds of light shell by hand. The trucks are halted about 1,000 yards west of Davidson Hill. The platoon is carrying its total capacity of 138 rounds per mortar, a total of 276 rounds. Seventy-two of these rounds are being carried by hand and 204 remain on the trucks. Of the total load, 56 rounds are heavy shell, one-half of which or 28 rounds (by prior arrangement with higher authority) are smoke shell.

The 1st Battalion will resume the attack as soon as the mortar platoon can furnish the required support. It is essential, therefore, that the mortar platoon provide this support as quickly as possible.

EMPLOYMENT OF THE MORTAR PLATOON

Let us observe the actions of Lieutenant Mortar Platoon, listen to his orders, and follow the operation of his unit from the time he receives the instructions of the battalion commander until the platoon opens fire on its initial mission.

Lieutenant Mortar Platoon directs the agent corporal, "Report to the battalion commander for liaison. If I leave this hill I will send you a runner and tell you where I am going."

He then uses his map to orient himself on the ground and spends a few moments in careful study of the terrain.

He is seeking a location for his mortars and for his observation post. He desires to place his mortars in defilade, where they will have as much cover and concealment as possible as well as a covered route of ammunition supply. Any location on the western slope of Davidson Hill will meet this general requirement. But the mortar position must be close enough to his observation post to permit the control of fire by voice or by hand and arm signals. Also the observation post must be at a point from which the targets are visible, and should preferably be close enough to the combat location of the battalion commander to insure rapid and uninterrupted communication between the battalion commander and the mortar platoon. With these considerations in mind, his rapid study of the map and the terrain convinces Lieutenant Mortar Platoon that he is restricted to Davidson Hill in his selection of positions, and his reconnaissance is limited to that area. Since time is pressing, he uses his trained personnel to speed up reconnaissance. Turning to the section sergeant, he orders: "We are to fire on those enemy locations (pointing to combat groups 1 and 2). Go to the south nose of this hill. Look for an OP from which both targets are visible, and which has a defiladed position for the mortars close enough for communication. Then join me. I will be on the northwest slope of this hill."

Followed by his runners, Lieutenant Mortar Platoon moves under cover toward the north spur of Davidson Hill. There he finds locations suitable for the mortar position and for his observation post. Both targets are visible from the site selected for the OP and it is close enough to the mortar position so that communication can be by voice. He is rejoined by the section sergeant, who reports that there is excellent observation of both targets from the southeast slope of Davidson Hill but that the mortars cannot be emplaced close enough for communication without exposing them to direct hostile fire.

Lieutenant Mortar Platoon now directs Runner No. 1, "Go back to the platoon. Guide it to this draw (the draw north of the first "D" in Davidson Hill). Tell the platoon sergeant and squad leaders to join me here."

He then directs Runner No. 2, "Go back to the trucks. Tell the transport corporal to move cross-country to the head of the draw just south of the water tanks (WT on Ebbert Hill) (pointing) and begin unloading the ammunition."

Lieutenant Mortar Platoon now locates the exact position of his base mortar (in this case the left or No. 2 mortar because the first target is on the left of the second target). He has the section sergeant move toward the crest of Davidson Hill to a position that will be on the general line between the area he selected for his mortars and target number one. From this position the section sergeant reads the azimuth with his compass to target number one, and then sights along the back azimuth. Lieutenant Mortar Platoon selects the spot for placing the base plate of the No. 2 mortar along this line and has Runner No. 3 mark the location of the base plate and place a stick on the line of the back azimuth which will determine the line: base plate—aiming stake—target number one. The section sergeant sights in these locations along the line of the back azimuth. The direction of fire to target number two is determined in a similar manner. The position for the number one mortar is then determined so as to place it close enough to the number two mortar so that the data as determined for the base mortar can also be used by the number one mortar. (Any of the methods prescribed for obtaining direction of fire for the old 3-inch trench mortar is applicable in this case and could have been used.)

As this preliminary detail is completed, the platoon sergeant and squad leaders arrive. Runner No. 3 points out to the squad leaders of the mortar squads the location of their base plate positions and of the sticks which mark the direction of the two targets. These sticks will be replaced by aiming stakes when the mortar squads arrive. At the same time Lieutenant Mortar Platoon directs the corporal ammunition squad, "Take Nos. 4 and 5 of each gun squad to assist you. The ammunition DP will be established at the head of the draw just south of the water tanks (pointing) (see Figure 72). As soon as the trucks have been

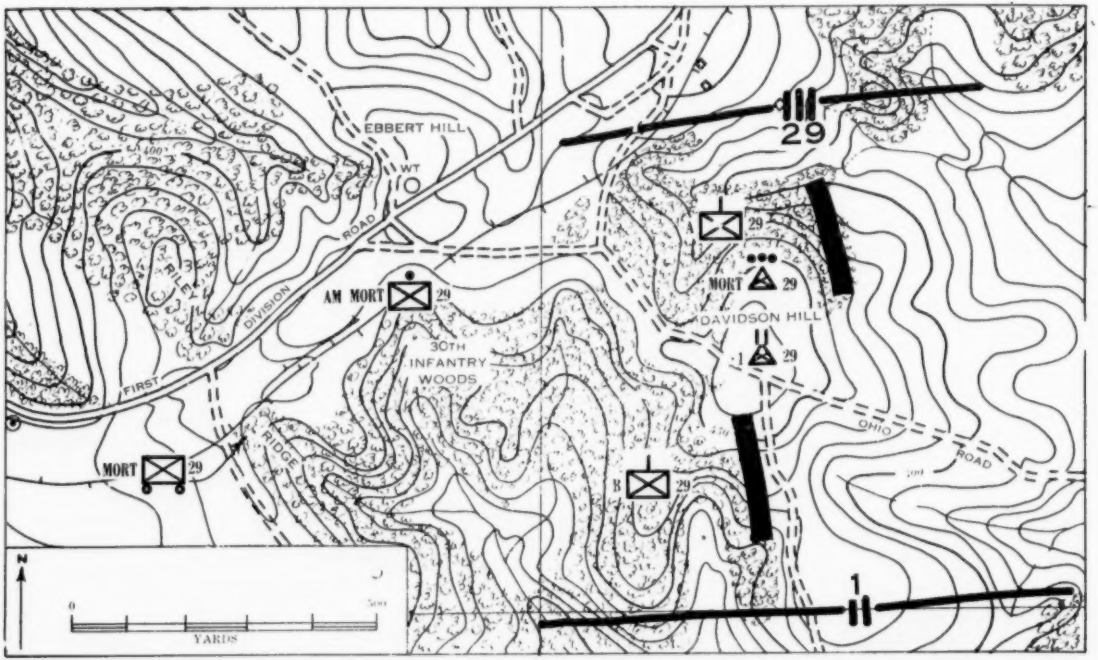


FIGURE 72.—Location of mortar platoon.

emptied, they will be driven to the battalion ammunition DP and refilled. Notify the transport corporal that the motor transportation when refilled will park, concealed by the trees, near the junction of the road and railroad on Riley Ridge. Your squad will move the ammunition from the DP to this position. Bring fourteen rounds of smoke on your next trip and return without delay. Move out."

Accompanied by the platoon sergeant, section sergeant, and mortar squad leaders the platoon leader moves toward the crest of Davidson Hill until hostile combat groups 1 and 2, as well as the mortar position, are visible. Glancing at his watch he notes that it is now 10:26 AM. Twenty-one minutes have elapsed and his preliminary arrangements are completed. The platoon is moving up toward its position and he is ready to issue his final instructions. They are quoted substantially as actually given on the ground.

"The enemy holds that high ground east of the creek (pointing). Enemy combat groups, with machine guns, are on that bare spur (Group No. 1) and on Green Hill (Group No. 2) (pointing). The battalion will resume the attack as soon as we are ready to open fire. The right assault company is along the trail to our right flank. The left assault company is along the forward slope of this hill.

"The right assault company will attack down that draw (pointing to the stream line just south of and paralleling the Ohio Road) and capture Green Hill (pointing).

"You know the mortar positions. No. 2 is the base mortar. Our first task is to neutralize that combat group (pointing to Group No. 1). It is two squares in width (by this Lieutenant Mortar Platoon indicates the target area as being equivalent to two 100 $\times$ 100 yards squares). Initial range 700 yards. Use light shell.

"The second task is to smoke that hill (pointing to Green Hill), then to neutralize the combat group there. Use smoke shell first at their maximum range. Change to light high explosive, with an initial range of 1,400 yards, on my order.

"Mark base deflection after you complete the first task. The battalion aid station is in the ravine just south of the location of our ammunition squad. Observation post here.

I will observe. Lay on first task and adjust on my order. It is now 10:29 AM. Are there any questions?"

No questions were asked. Dismissing the platoon sergeant and mortar squad leaders and turning to the section sergeant, Lieutenant Mortar Platoon continued:

"Look at this map. Join the right assault company and follow its advance. Reconnoiter a route for the forward displacement of the platoon as far as the Old Hickory Road. Then join me here. If we commence our forward displacement before your return, I will follow the stream line just south of this (Ohio) road toward Green Hill. Any questions? Move out."

With a minute or two at his disposal, while the mortar squads are placing their pieces in position, Lieutenant Mortar Platoon has time for a hasty consideration of his ammunition supply, and of the time required to fire both missions.

The mortar platoon carries with it, in its organic transportation, 138 rounds of shell *per mortar*. Of these 138 rounds, 110 are light shell and 28 rounds are heavy shell. By previous arrangement one-half, or 14 rounds, of the heavy shell is smoke.

His ammunition supply contains 28 rounds of heavy shell (high explosive). These shell are designed primarilly for use against material such as machine guns in protected emplacements. During an attack in an open warfare situation the light shells are used for neutralization of hostile combat groups and for firing on hostile machine guns.

Firing at their maximum rate, the mortars would use up this entire supply of ammunition in about 2½ minutes. It is not likely that the refilled ammunition trucks can return in less than 30 minutes, even if the battalion ammunition refilling point is very close. So it is imperative that the platoon use no more ammunition than is actually required to do its job well.

Lieutenant Mortar Platoon has estimated the area of each of the hostile combat groups as about 200 yards in width and 100 yards in depth. In order to determine the

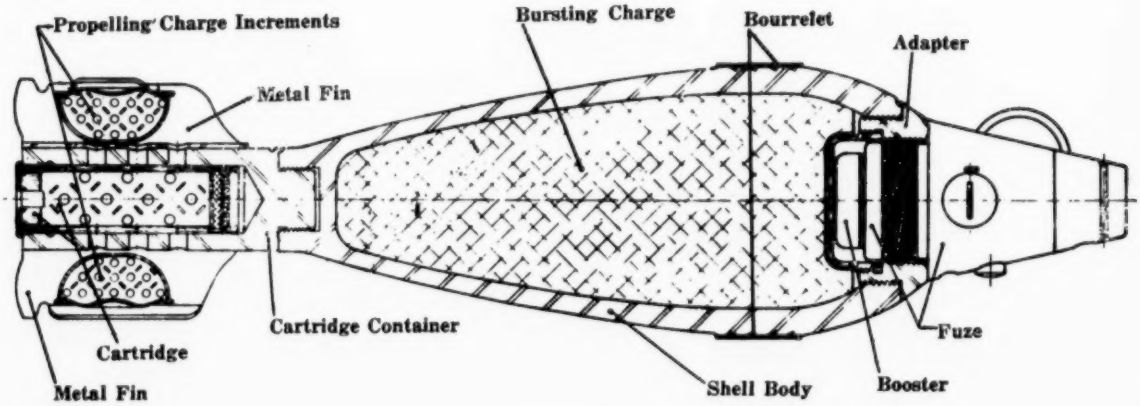
number of rounds required to cover such an area thoroughly, he calculates as follows:

1. The width of the area, 200 yards, divided by the effective width of a single burst (25 yards) equals 8. This is the number of rounds required to cover the width of the area. He adds one round to be sure of covering the width of the target. Total—nine rounds.

2. The depth of the target, 100 yards, divided by 25 yards, the amount of a single range bound, equals 4—the number of range bounds required to cover the target in depth. He adds one range bound to insure covering the entire target. Total—five range bounds.

Therefore the total number of rounds required to cover thoroughly an area 100 × 200 yards will be nine rounds (required to cover the target in width) times five rounds (the number of range bounds required to cover the target in depth), or a total of 45 rounds of light shell. He allows himself three rounds for adjustment and decides that he can accomplish his first task with a minimum of 48 rounds of light shell.

He must also blind the hostile observation on Green Hill. This requires smoke shell. Smoke is provided now only in the heavy shell, which has a range of 1,280 yards. Firing at extreme range, his mortars cannot quite reach the crest of Green Hill from the positions he has selected; in fact, their bursts will be about 150 yards short of the crest, and the shells will strike on the west slope of the hill about halfway between the crest and the Old Hickory Road. However, the smoke shell produces an umbrella-shaped cloud, which rises very quickly to a height of about 200 yards. Even though the bursts are short, the cloud will be built up across the western face of the hill, and will blind observation from the crest in that direction. Lieutenant Mortar Platoon decides to use 14 rounds of smoke shell for this task, and to repeat if necessary, as it is imperative that the hostile observation on Green Hill be blinded if the maneuver of the battalion is to succeed. He allots an additional 50 rounds of high explosive light shell to neutralize hostile combat group 2. He will still have enough light shell left

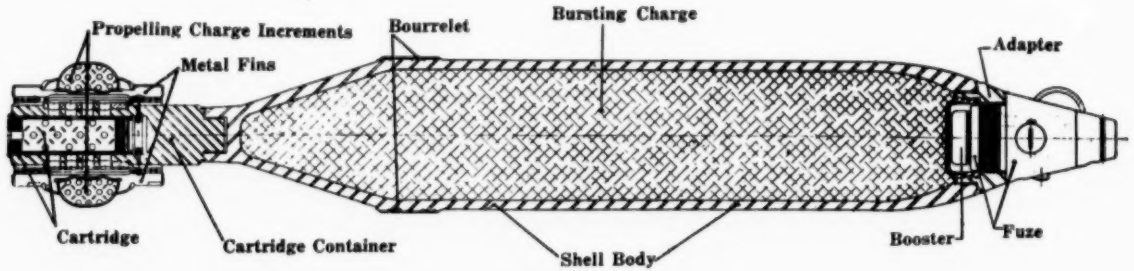


SHELL, H. E., M43 (light)

to repeat his concentration on either or both targets, if the result of his first firing is not sufficiently effective. His mortars could fire all the shell required for both missions in less than three minutes. But he will adjust carefully, and will relay after each round, since his ammunition is too precious to waste. Three minutes will be sufficient for adjustment on his first task and he can complete the task in at least three minutes more. No adjustments will be required for the second task as the mortars will fire at the maximum range of the heavy shell, and only a minute or two will be necessary to switch from the first target to the second.

A total of 112 rounds is needed at the position to complete the firing. Seventy-two rounds of light shell are already at the position, brought up by the platoon when it came forward. You will recall that 18 rounds were carried by each mortar squad and 36 rounds were carried by the ammunition squad. Each ammunition carrier can transport six rounds of light or four rounds of heavy shell, and there are now ten men to carry ammunition. One additional trip of the ammunition squad, reinforced as it is by men from the mortar squads, will bring to the position 14 rounds of heavy shell (smoke) and 38 rounds of light shell. This amount, 52 rounds, together with the 72 rounds already at the position, is sufficient to cover both tasks. The first trip will require about twenty to twenty-five minutes as the trucks must move forward before ammunition will be available at the ammunition DP. Subsequent trips should not require more than fifteen minutes each, allowing for time to pick up and drop loads. The squad has been on the way for five minutes and should be back by 10:50 AM.

Fire for adjustment might begin before the return of the ammunition squad, or even fire for effect on the first target. But movements of small units in forward areas cannot be predicted on an accurate time schedule, and Lieutenant Mortar Platoon, very humanly, wishes to take no chances of fumbling his job by promising more than he can perform. Glancing down toward the mortar positions, and noting that the base pits are dug and the mortars emplaced,



SHELL, H. E., M45 (heavy)

he embodies this information in a message to the battalion commander at 10:36 AM:

"We can open fire at about 11:00 AM. Recommend that rifle companies advance twelve minutes after we fire our first round."

Turning to Runner No. 3 he directs: "Take this message to the battalion commander. Then join the agent corporal at the battalion observation post (pointing) and tell him the location of the mortars and my observation post. Remain with him."

Lieutenant Mortar Platoon moves downhill to the mortars and checks their emplacement. Satisfied, he gives the initial fire order:

"High explosive, light
Superquick
Scale three two, drum one hundred
Left stake
At my signal
Number two, one round
Seven hundred."

Returning to his observation post, he receives the following message from the battalion commander at 10:48 AM:

"Companies have been instructed to attack twelve minutes after your fire begins. Open fire as soon as you are ready."

During the next few minutes, Lieutenant Mortar Platoon alternately scans his targets and glances anxiously toward the east slope of the ravine at his rear. He sees the corporal of the ammunition squad at the head of his little column moving forward through the trees. Again he looks at his watch. It is 10:53 AM and he gives the signal for firing the first round.

DISCUSSION

When the mortar platoon was attached to the 1st Battalion, the platoon moved on trucks to a point selected by Lieutenant Mortar Platoon which would be close to the probable mortar position and still remain out of hostile

aimed fire. As details of the situation were not known at this time to Lieutenant Mortar Platoon, he halted the trucks concealed by trees on Riley Ridge close to the road and railroad crossings. Here the platoon was detrucked, the mortar squads and the ammunition squad moving on foot to concealed position shown in Figure 1. In moving forward the mortar squads carried by hand its weapons, equipment, and 18 rounds of light shell. The ammunition squad moved forward also and carried 36 rounds of light shell. This provides 72 rounds of light shell with the mortar platoon available for immediate use.

In selecting his first firing position, the mortar platoon leader thinks of three essential considerations which will govern the location of the mortars. The first, and most important, is observation. The second, and of almost equal importance, is communication, both with the mortar position and with the battalion commander. The third is ammunition supply. With the mortars, as with other infantry weapons, we must be able to see the target in order to fire on it effectively. But observation of the target is of no value unless used to correct the laying of the mortars. Since no mechanical facilities for communication are available, the observation post and the mortar position must be close enough together to permit communication by voice, or by hand and arm signals between the observer and the mortar position. This requirement may necessitate some compromise between an ideal location for the mortars and the observer, and locations close enough together to permit rapid communication. In the present situation it demands that the mortars be emplaced closer to the crest of Davidson Hill than might otherwise be desirable if cover and concealment alone were considered.

It is also essential that the platoon leader be in close contact with the commander from whom he receives his fire missions. The requirements of the situation may change rapidly, and the mortars can accomplish with certainty their mission of providing constant close support for the rifle units, only when demands for mortar fire are received and responded to promptly. These demands will ordinarily

come directly from the battalion commander, who is in the best position to know where fire support is needed most urgently in his zone of action.

The battalion OP is the usual combat location of the battalion commander during an attack. Lieutenant Mortar Platoon will place his own OP as close as he can to that of the battalion commander, and still maintain communication with his mortars. He sends his agent corporal and a runner to remain with the battalion commander in order to insure the maintenance of communication in the event that the battalion commander leaves his observation post.

Ease of ammunition supply to the mortar position is the third important consideration. Mortar ammunition is heavy, and is consumed at a very rapid rate. Therefore, it is highly desirable that the mortars be located so as to permit the ammunition trucks to approach, by a covered route, a point close to the mortar position. At best, ammunition will have to be transported by hand for a considerable distance, and it is important to reduce this distance as much as possible. Because of the rapid rate of ammunition consumption it is desirable to bring all available ammunition to the mortar position and then immediately refill the trucks. The orders given to the ammunition squad would provide Lieutenant Mortar Platoon with an additional 164 rounds which would include 14 rounds heavy shell (smoke), 28 rounds heavy shell (high explosive), and 122 rounds of light shell (high explosive). These would be available for refiring the first or second tasks or for firing on other targets, should they present themselves. When all tasks have been completed, the ideal ammunition supply situation would be to have all trucks fully loaded and to have at the mortar position the 72 rounds that are carried by hand. There is one other ammunition requirement; thirty rounds must be kept as a reserve to be fired only on orders from the battalion commander.

The best location for the ammunition squad is at that point where the ammunition trucks are forced to halt their forward movement in order to prevent exposure to hostile fire, as it is from this point that the hand transportation of

ammunition will begin. In the present situation trucks can move, by traveling cross-country under cover from aimed machine-gun fire, as far forward as the southwest slope of Ebbert Hill. From this point the ammunition squad will relay the ammunition to the mortar position.

The mortar platoon leader must constantly look ahead, anticipate his future movements, and use his personnel to save time. In this situation, the reason for the message to the platoon to move to the vicinity of its firing position is obvious.

The combat duties of the sergeant, section leader, are not so definitely prescribed. He replaces the platoon sergeant, if the latter becomes a casualty, but other than this he has no specific duty. At The Infantry School it has been found advantageous to use this experienced noncommissioned officer for advanced reconnaissance. Thus he assists the platoon leader by selecting routes for forward movement, and tentatively locating new mortar positions to which the platoon will displace when necessary. The mission of the agent corporal in combat is a matter of routine. It is his duty to insure constant communication between the leader of the mortar platoon and the battalion commander, in order that the platoon leader may receive fire missions promptly.

When the tasks prescribed by the battalion commander were actually fired, the following occurred:

The mortar platoon occupied its position rapidly, and was ready to fire about 30 minutes after the platoon leader received the battalion commander's initial instructions. It will be apparent from the exercise that much of the time used in preparation for firing was consumed by the handling of ammunition. The first shell fired for adjustment on hostile combat Group No. 1 burst within 50 yards of the target. The platoon leader corrected the range and fired for effect without further adjustment. High explosive light shell was used, and each round fired was effective. One mortar of the platoon then switched to Green Hill, and an effective smoke screen was built up in less than two minutes. Here, however, a difficulty was encountered which might have

been foreseen. Because the smoke screen persisted for about ten minutes, it was impossible to place observed fire through it, at once, with high explosive shell to support the attack of the assaulting rifle company. Fortunately, there was enough wind to thin the smoke sufficiently to enable effective fire to be resumed with both mortars after ten minutes. This was an effective and convincing demonstration that a smoke screen can hinder as well as help.

The exercise illustrates one brief phase of the action of a mortar platoon in a combat situation. As actually conducted, with troops and with live ammunition, it consumed approximately 35 minutes of an action which would have continued during the greater part of the day. Each succeeding phase of this action would have presented another and a different problem, but the principles to be applied and the considerations involved would have been substantially the same. Not the least of these considerations is the necessity for husbanding carefully the supply of ammunition.

CHAPTER 7

The M1 Rifle

(INFANTRY SCHOOL STUDY)

The new semiautomatic rifle is officially known as the U.S. Rifle, Caliber .30 M1. It is a self-loading, gas-operated, clip-fed, air-cooled, shoulder weapon. The principal characteristic of this weapon is its mechanical operation which enables the individual rifleman to deliver a large volume of accurate fire upon any designated target within range. Its fire power is considerably greater than that of the Springfield rifle. Eight cartridges are loaded in a reversible clip. The rifle fires but once for each squeeze of the trigger. When the eighth shot has been fired, the empty cilp is automatically ejected upward out of the receiver to the right and the bolt remains open ready for the insertion of another clip. The rifle is 43 inches in length, weighs 8.94 pounds, and has a pistol-grip stock. Provision has been made for attaching a bayonet, which weighs one pound.

An outstanding feature of the new rifle is that the much lighter shock of recoil does not hurt the recruit firer the first time he fires a shot. This eliminates the fear of being hit on the jaw or in the face that was always present when teaching recruits to fire the Springfield rifle. Hence the tendency to flinch is markedly less and the firer is able to concentrate all his attention on correct aiming and firing.

FIGURE 73.—The M1 rifle.

Another factor making for increased accuracy and reduced training time is the sights of the M1. The rear sight

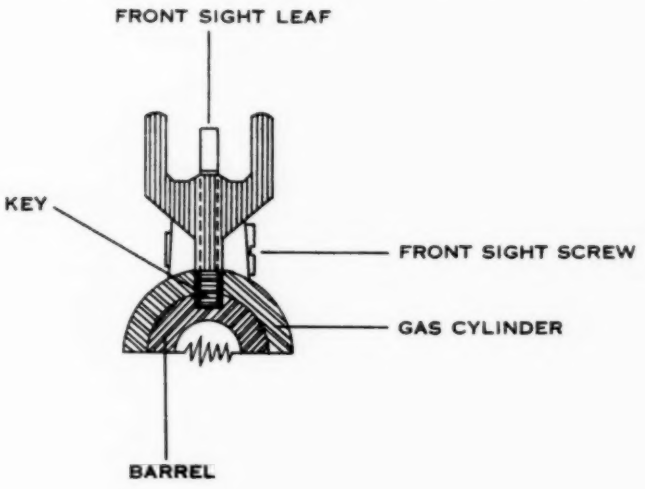


FIGURE 74.—Front sight.

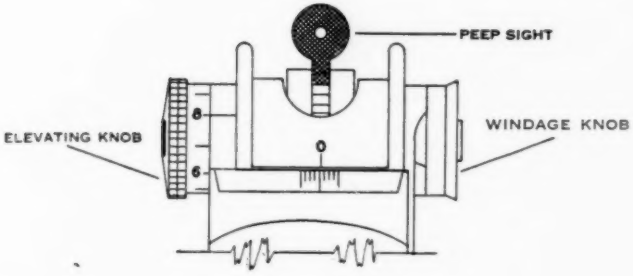


FIGURE 75.—Rear sight.

is of the aperture type and has been mounted on the receiver so as to be as close to the eye as possible. The elevation drum on the rear sight is so constructed that when you

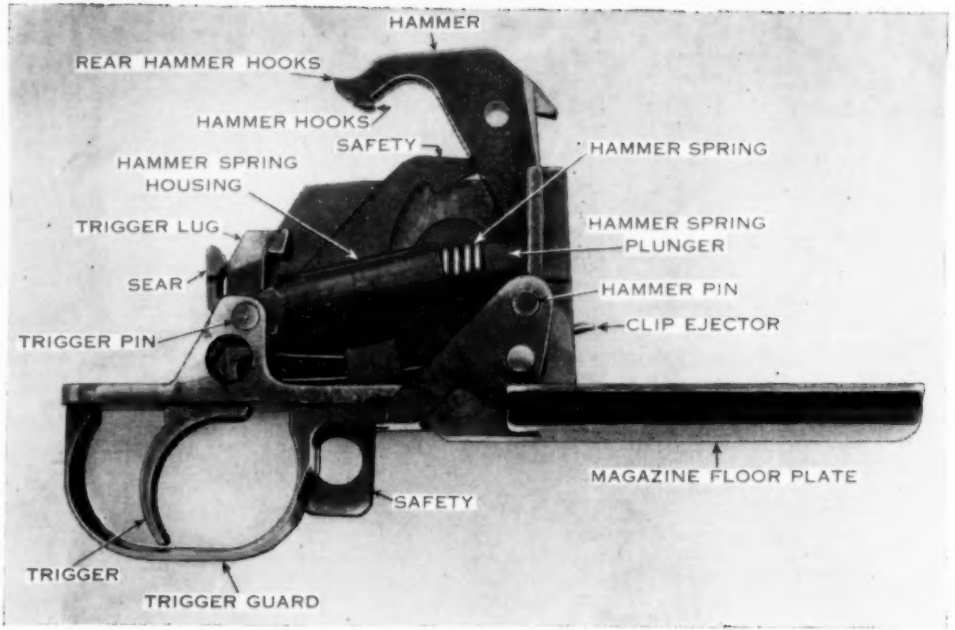


FIGURE 76.—Trigger housing group assembly (Hammer in fired position).

wish to fire at four hundred yards it is possible to correct for the zero of the rifle and actually set four hundred yards on the rear sight. The rear sight is operated in elevation by means of a knob on the left side of the receiver. Range graduations are engraved on the periphery of the knob in 100-yard increments up to 1,200 yards. Between each 100-yard graduation mark adjustment can be made in 25-yard

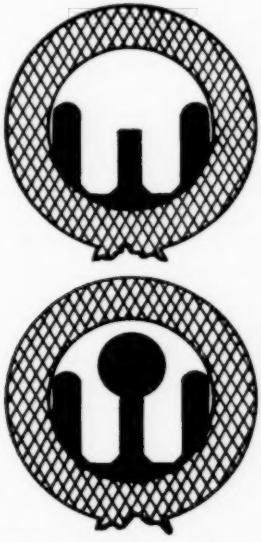


FIGURE 77.—A correct sight with the M1 rifle.

steps, one click being equal to 25 yards. Windage adjustments are made by means of a knob on the right side of the receiver directly opposite the range knob. The broad front sight is designed to eliminate blurring. It is of the blade type and protected by two guards. All elevation and deflection changes are in minutes of angle, and each click of the rear sight will move a bullet one inch for each 100 yards of range in both elevation and deflection. All complicated rules of windage, as was necessary for the Springfield rifle, are thus eliminated.

One of the most important characteristics of the M1 rifle is the reduction of fatigue on the firer. It is possible to fire many rounds with no shoulder padding and still be fresh enough for all normal combat firing.

Due to the absence of bolt manipulation during firing and subsequent absence of movement which tends to disclose the position of the firer, the location of the M1 firer cannot be detected with the ease with which a Springfield rifleman in similar cover can be detected.

Ammunition may be loaded into clips at the factory. A clip-loading machine is provided, or in an emergency the ammunition may be loaded into the clips by hand. There are two staggered rows of four rounds in each clip, and it is immaterial whether the topmost round in the clip is on the right or the left side. The clip can be inserted into the rifle either side up. A loaded clip weighs one-half pound.

Disassembly for cleaning is simplicity itself. No tools, other than a caliber .30 cartridge, are required for such disassembly. After approximately 1,000 rounds, the gas cylinder plug should be removed and the carbon scraped from the plug. No tools are required for this operation other than a small screwdriver which is provided as part of the combination tool.

The 29th Infantry has fired the M1 rifle through a complete marksmanship season. The following notes have been prepared by "C" Company, 29th Infantry, and briefly present some suggestions that will assist an organization commander during marksmanship training.

M1 NOTES

Prior to beginning the regular marksmanship season one officer and 24 noncommissioned officers and selected privates completed record firing. These men went through the prescribed preparatory marksmanship training before firing on the range. This group, together with men who had previously qualified as expert with the M1 rifle and who were not required to fire, constituted the demonstration and instructor group during the regular season.

The company was divided into groups of six men with two noncommissioned-officer instructors assigned to each group. The groups and their instructors worked together throughout all preparatory training and during firing for record. Group prizes, as well as individual prizes, were given in an effort to stimulate group competition. It is believed that group prizes tended to maintain a high and enthusiastic spirit of competition.

Prior to and during the preparatory exercises, great emphasis was placed on physical exercises and games designed to harden men for firing.

Organization of the company for marksmanship instruction was based on the desire to insure that every man would receive adequate instruction according to his capabilities. To accomplish this objective, company administrative duties were so arranged that each man attended either the morning or afternoon period of instruction. Proficient men attended only one-half day's instruction. Backward men attended both morning and afternoon periods. This stimulated work during the morning period and rewarded those men who quickly became proficient.

Prior to starting the preparatory exercises the following instructional equipment, in addition to that prescribed by paragraph 12, Basic Field Manual, Volume III, Part One, Chapter 1A, was prepared:

1. Small blocks of hardwood were prepared for each rifle to fit in the rear third of the operating rod guide groove.

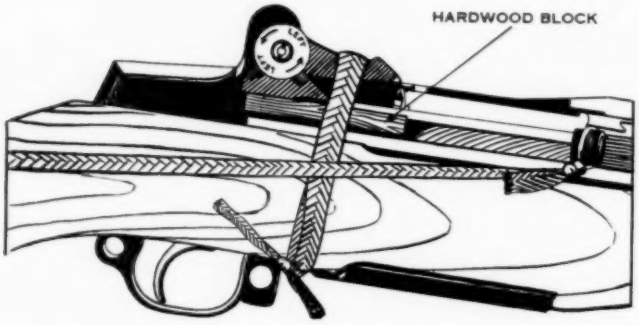


FIGURE 78.—M1 rifle with hardwood tied in position and tape tied to operating handle.

These blocks of wood were used to allow the operating rod to move only part way to the rear during time-fire exercises. This prevented the usual interruption which would otherwise occur during cadence exercises caused by the coach pushing the operating rod too far to the rear when he recocks the piece.

2. About three feet of heavy tape was provided for each rifle. This tape was tied to the operating rod handle. During time-fire and cadence exercises the coach placed himself in rear of the pupil and each time the trigger was squeezed the coach jerked on the tape, pulling the operating rod to the rear, and cocking the piece. The action and movement of the rifle in these exercises very closely resembles the action obtained during firing.

FIGURE 79.—Time-fire exercises. Firer in prone position. Coach pulling operating handle with tape.

Some of the equipment needed by each squad, as covered in the Basic Field Manual, was modified so as to train the men in using the M1 sights and in looking at targets of the same shape as the "D" target. All known-distance firing with the M1 rifle is at "D" targets. The following changes in equipment were made:

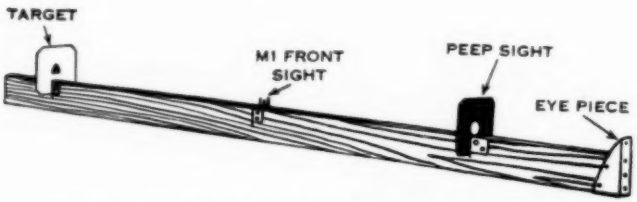


FIGURE 80.—Modified sighting bar with M1 sights and silhouette target.

1. The sighting bars were changed so that the picture obtained by the man was the same as that seen when looking through the sights of the M1 rifle. A front sight arrangement was made which resembled the front sight and front sight guards of the M1. The front sight was moved closer to the peep sight so that when the eye was placed at the eye piece of the sighting bar a true M1 sight picture was obtained.

2. All sighting disks and aiming targets were changed from the round bull's eye to a silhouette the shape of that

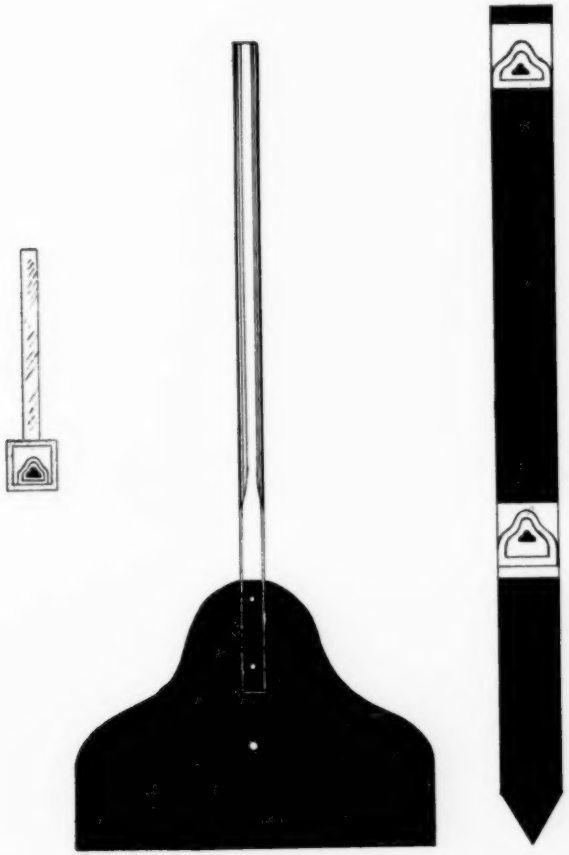


FIGURE 81.—Sighting disks and aiming targets for M1 rifle.

on the "D" target. For making long-range triangles, aiming disks were prepared the same size as the "D" target, and triangles were made using these disks.

During preparatory exercises a large proportion of the total time available was spent on time-fire exercises. At first the men were taught to perform each detail of these

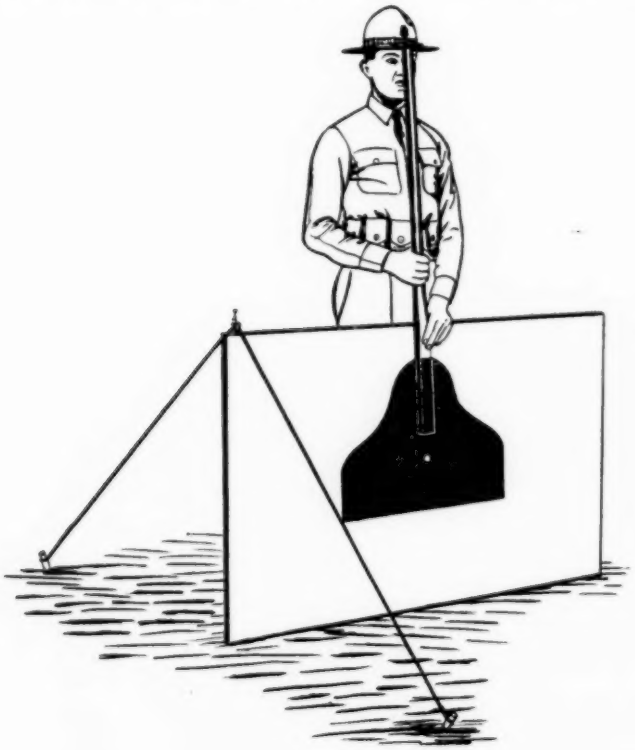


FIGURE 82.—Equipment for long-range triangles.

exercises slowly and deliberately. The exercises were speeded up gradually until the desired cadence was obtained.

FIGURE 83.—Time-fire exercises. Firer in kneeling position. Coach pulling operating handle.

Every man was checked and rated prior to range firing on all phases of preparatory training by his noncommissioned-officer instructor and by an officer instructor.

In order to insure the best possible operation of the rifle and to avoid interruptions which might occur during the rifle marksmanship season the following precautions were taken:

1. Rifles were checked to insure that they were clean and properly assembled.

2. Occasionally a few drops of oil were placed in the gas cylinder of each rifle. It is believed that this tends to eliminate the accumulation of carbon in the gas cylinder and gas cylinder plug. No difficulty from excess carbon deposits was encountered.

3. Charts for individual zeroes of rifles were kept throughout the firing. Not only were zeroes recorded for wind corrections and range elevations, but the sights were run back all the way to the bottom and the total number of clicks from the bottom to the proper zero were counted and recorded. This obviated the necessity of rezeroing the rifle if the elevation knob became loosened. Once zeroes were obtained, a noncommissioned officer checked each man's sight setting as he went up to fire.

4. Throughout instruction firing, backward men were given special attention under specially selected instructors in addition to receiving the normal company instruction.

CHAPTER 8

Individual Training With the U. S. Rifle Caliber 0.30 M1

(INFANTRY SCHOOL STUDY)

The M1 rifle, like all new weapons, presents marksmanship training problems which can be solved best after practical experience in the use of the weapon. Although these problems are basically similar to those met with in marksmanship instruction with the familiar Springfield, they are, of course, not identical. The experience gained in teaching M1 marksmanship to the regular classes at The Infantry School has been the source of the schedules and suggestions contained in this chapter. The purpose of this chapter is to ease the way for any officer conducting a marksmanship course with this rifle for the first time. Therefore you will find herein a detailed schedule with suggestions on methods of organization, preparation of equipment and training areas, and use of the demonstration group. This schedule and these suggestions should save time and prove of definite assistance to officers who will conduct marksmanship courses with the M1 rifle in the near future.

Individual training with the M1 rifle is divided into four phases: Mechanical Training, Preparatory Marksmanship Training, 1,000-inch Range Practice, and Known Distance Range Practice. Training should proceed in the several phases in the sequence outlined in this chapter.

The amount of time allotted to Mechanical Training and Preparatory Marksmanship Training is usually prescribed by higher headquarters. It is considered that forty hours is the minimum time necessary for training in these two phases if satisfactory results are to be obtained. In Column A of the detailed schedule presented herein there has been listed the allotment of time recommended for the various steps. If less than forty hours are available the time should be allotted to the various steps in the same proportion as indicated in Column A. If more than forty hours are available for these two phases, the additional time should be applied in a manner similar to that indicated in Column B, which shows a suitable allotment when fifty-two hours are available.

This schedule should be used as a guide only; local conditions will necessitate modifications.

MECHANICAL TRAINING

(Total Hours for this Phase: 12 for Column A; 16 for Column B)

FIRST DRILL PERIOD

STEP ONE

Subject and Equipment	*Allotment of Hours*		*Text References* (Supplement No. 2 to Standard Nomenclature List No. B-21.) #
	A 3 hrs.	B 4 hrs.	
General description of the rifle. EQUIPMENT: *Per man*: 1 rifle; 1 cartridge, dummy, caliber 0.30, M1906-corrugated; 1 clip, cartridge.	¼ hr.	¼ hr.	Section II
Disassembling and assembling. EQUIPMENT: *Per squad*: 1 screwdriver, 3/16-in. blade*, or combination tool; 2 "Forms showing state of instruction" (see par. 32*d* Basic Field Manual, Volume III, Part One, Chapter 1A); (desirable but not essential: 1 folding table per 4 men, 1 chair per individual.)	2¾ hrs.	3¾ hrs.	Section V (Omit pars. 21*f*, all of 21*g* except *g*(1), 21*h*, 21*i*, 23, 24, 26*a*, 26*b*. 26*c*, except replacement of gas cylinder plug and screw, 26*d*.)

*Desirable #Dated March 17, 1939.

FIRST DRILL PERIOD (*Continued*)

Subject and Equipment	*Allotment of Hours*		*Text References* (Supplement No. 2 to Standard Nomenclature List No. B-21.)
	A 1 hr.	B 1½ hrs.	
Care and cleaning of the rifle. EQUIPMENT: *Per man*: 1 rifle; 1 cartridge, dummy, M1906-corrugated. *Per squad*: 2 cleaning rods, patches, 1 tube graphite (Dixon's No. 3), 2 oz. aircraft machine-gun lubricating oil, wiping cloth, soap and water.	1 hr.	1½ hrs.	Section VI

AREA

Room, porch, or outdoors. The group undergoing instruction should be closely assembled.

TRAINING NOTES.

To facilitate the training of the organization, a sufficient number of assistant instructors should be trained ahead of scheduled periods to provide one assistant instructor for each four men.

For scheduled periods arrange the students in groups of four at tables or on the ground. In the latter case provide a shelter half or other suitable material for each group to keep parts of the rifle off the ground. The instructor should be thoroughly familiar with the subject. He should conduct the training from a raised platform and orally describe the rifle and its detailed disassembly and assembly. Concurrently with instructor's explanation, the assistant instructors actually disassemble and assemble the rifle, during which time they are closely observed by the students. Following this, each student disassembles and assembles his own rifle, aided by an assistant instructor, until he is familiar with the operation. No special effort is made to teach nomenclature, since students become familiar with the names of parts during the course.

Assistant instructors demonstrate cleaning and lubrication and then supervise each man as he performs the operation on his own rifle.

SECOND DRILL PERIOD

STEP TWO

Subject	*Allotment of Hours*		*Text References* (Supplement No. 2 to Standard Nomenclature List No. B-21.)
	A 4 hrs.	B 6½ hrs.	
Functioning.	1 hr.	2 hrs.	Section IV
Operation.	1½ hrs.	2½ hrs.	Section III
Immediate action and stoppages.	1½ hrs.	2 hrs.	Section VIII

EQUIPMENT.

Per man: 1 rifle; 1 clip, cartridge; 8 cartridges, dummy, caliber 0.30 M1906-corrugated.

Per squad: 1 screwdriver or combination tool.

AREA.

Same as described for Step One.

TRAINING NOTES.

Have the barrel and receiver group and the trigger housing group assembled and latched together (without stock group). The instructor first explains, in a general way, the action during recoil and counter recoil. Concurrently, the assistant instructors point out the parts as mentioned and illustrate the action described. In a similar way the detailed functioning is described and shown to the student. To insure thorough understanding, the assistant instructors have each man describe the functioning, operation, immediate action, and stoppages. Stress *OPERATION*. The men should become especially skillful in *LOADING, UNLOADING, CLEARING THE GUN, and IMMEDIATE ACTION*.

THIRD DRILL PERIOD

STEP THREE

Subject	*Allotment of Hours*		*Text References* (Supplement No. 2 to Standard Nomenclature List No. B-21.)
	A 4 hrs.	B 4 hrs.	
Review of mechanical training and examination.	4 hrs.	4 hrs.	All references listed under mechanical training.

EQUIPMENT AND AREA.

Same as shown for Steps One and Two.

TRAINING NOTES.

The assistant instructors and platoon leaders determine the state of training of all individuals by requiring each man to disassemble and assemble the rifle, demonstrate how it is cleaned and lubricated, describe the functioning and immediate action, and demonstrate skill in loading, locking, unloading, sight adjustment, clearing the gun, and immediate action. The proficiency of each man is indicated on the form designed for this purpose. Deficiencies are corrected on the spot.

PREPARATORY MARKSMANSHIP TRAINING

(Total Hours: 28 for Column A; 36 for Column B)

FOURTH DRILL PERIOD

FIRST STEP—SIGHTING AND AIMING EXERCISES

Subject	*Allotment of Hours*		*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 4 hrs.	B 4 hrs.	
Purpose of preparatory marksmanship training.	¼ hr.	¼ hr.	See Training Notes.
Sighting and aiming exercises. Explanation and demonstration.	½ hr.	½ hr.	Pars. 16 to 18 both incl.
First sighting and aiming exercise.	½ hr.	½ hr.	Par. 16
Sight blackening.	¼ hr.	¼ hr.	Par. 12*b*(4)
Second sighting and aiming exercise.	½ hr.	½ hr.	Par. 17
Third sighting and aiming exercise.	2 hrs.	2 hrs.	Par. 18

EQUIPMENT.

(See par. 12, Basic Field Manual, Volume III, Part One, Chapter 1A.)

Per man: 1 rifle.

Per 4 men: sighting bar (with rear sight and target); 1 rifle rest; 1 3-inch sighting disc; *1 10-inch sighting disc; 1 small box (ammunition box is of suitable size); *1 target frame (machine gun) covered with blank paper; 1

examination form (see par. 32*d*, Basic Field Manual, Volume III, Part One, Chapter 1A) ; sight blackening material; 1 pencil; 2 sheets white paper, and tacks, for making triangles at 50 feet; *tissue paper for copying 200-yard triangles.

**Note*: Omit these items if lack of time or area precludes making triangles at 200 yards.

AREA.

See Figure 84.

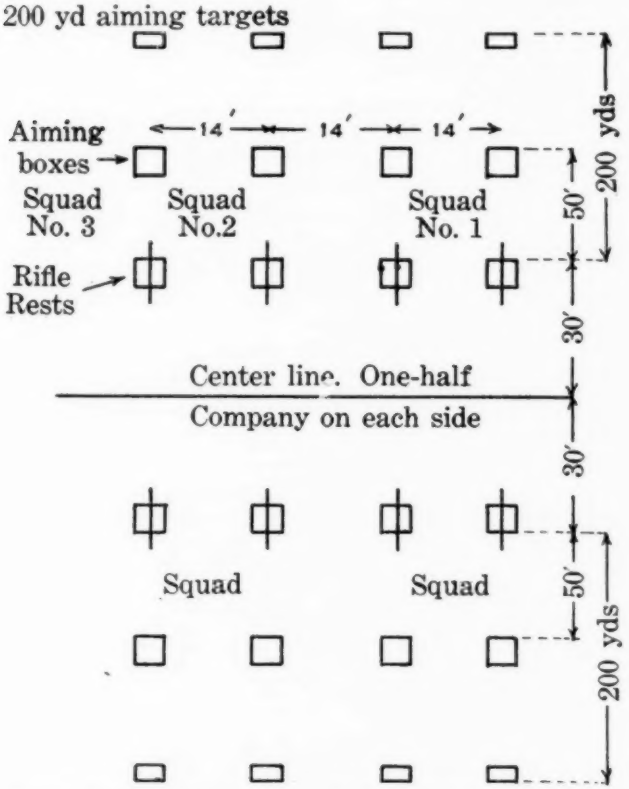


FIGURE 84.—Training area organized for sighting and aiming exercises.

TRAINING NOTES.

a. Purpose of preparatory marksmanship training.—The purpose of marksmanship training is the development of good shots, since there is no substitute for hits on the battlefield. The preparatory training for rifle marksmanship has been designed to teach men the correct way of doing each essential and to drill them in those essentials until correct performance becomes a habit. Good shots are developed on the preparatory training field.

All infantry officers should know how to develop the rifleman's skill in the use of his weapon. Almost any man can be taught to shoot well. Shooting requires no inborn talent, but is purely a mechanical operation which nearly anyone can learn if properly instructed. The instruction has been divided into steps. The men are taught the first step and practice that step until it is mastered before advancing to the next step. Having been taught all the steps in their proper order, a man goes to the range to apply what he has learned.

The instruction in preparatory rifle marksmanship is presented in three ways: first, explanation; second, demonstration; and third, application. The soldier is required to do everything exactly right. The equipment we provide for this work must be serviceable, so that it will be possible for him to perform the exercises in the desired manner. There is no room for halfway measures in preparatory marksmanship training. Men instinctively do the wrong thing in firing the rifle for the first time. They give the trigger a sudden yank which causes flinching. Therefore men cannot be taught to shoot by merely giving them ammunition and allowing them to fire at will on the target range. This method soon develops bad habits. However, if we thoroughly instruct the men, step by step, until correct performance becomes a habit, they will shoot well, beginning with the first day on the range.

Throughout the entire training period instruction is carried on by the coach and pupil method. Whenever a man is in the firing position, during both the preparatory exercises and the instruction range practice, a coach should be at his side. The value of this training is lost unless errors are quickly detected, brought to the attention of the soldier, and corrective measures taken.

b. Conduct of training.—The instructor explains to the organization the purpose and manner of performing the exercises. A previously rehearsed squad briefly, but thoroughly, demonstrates each exercise. Following this, the men move to their respective places on the field and work on the three exercises in turn as directed. Squads are divided into two sub-groups of four men each. The squad leader and second-in-command of each squad take direct charge of the work in sub-groups supervised by the platoon leaders. Extreme care and accuracy are insisted upon. All demonstrations during preparatory training should include demonstrations of the common errors made by men when first attempting the particular exercise; this serves to emphasize the correct methods and forewarns the men of "things to avoid".

FIFTH DRILL PERIOD

SECOND STEP (POSITION EXERCISES)

Subject	*Allotment of Hours*		*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 4 hrs.	B 6 hrs.	
POSITION EXERCISES			
Explanation and demonstration.	½ hr.	1 hr.	Pars. 19 to 24 both incl.
Gun sling adjustment; trigger slack, holding the breath, general rules for positions.	½ hr.	½ hr.	Par. 19
Prone position and sandbag rest position.	1 hr.	1½ hrs.	Pars. 20, 21
Sitting position.	½ hr.	½ hr.	Par. 22
Kneeling position.	1 hr.	1½ hrs.	Par. 23
Standing position.	½ hr.	1 hr.	Par. 24

EQUIPMENT.

Per man: 1 rifle, elbow pads (recommended).

Per 8 men: sight blackening material; 1 target, M1, 1,000-inch, on frame, installed upright with stakes or pedestal; 4 sandbags.

Per 3 squads: 1 "D" target on frame, with curtain, installed upright.

AREA.

See Figure 85.

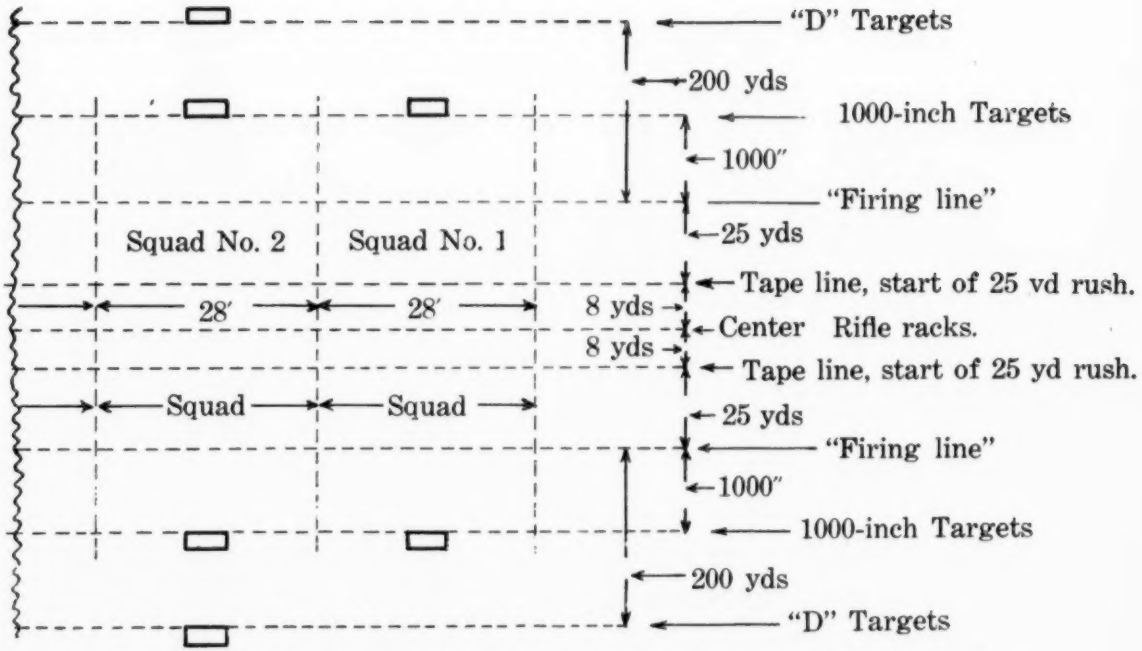


FIGURE 85.—Training area organized for position, trigger squeeze and time fire exercises.

The portion of the training field illustrated on the preceding page shows an organization formed in two lines facing away from each other. This formation facilitates supervision. The same field may be adapted to sighting and aiming exercises by placing aiming boxes on a line 50 feet distant from the "firing line" and rifle rests on the "firing line".

TRAINING NOTES.

The instructor explains to the assembled organization the purpose and manner of performing each exercise. The coach and pupil system is explained. A previously rehearsed squad demonstrates all positions and exercises. Following this the men of each squad are divided into pairs (coach and pupil) and move to their places on the field. Each position exercise is taken up in turn as directed by the instructor. Coach and pupil change places frequently, as directed, so that all men will obtain equal training. The instructor stresses the duties of the coaches and has all errors corrected promptly. M1, 1,000-inch, and "D" targets are used as aiming points. An "exercise" consists of the pupil assuming the correct position, holding the breath, taking up the slack, and aiming carefully until he runs out of breath, or his aim becomes unsteady. The exercise may be initiated by the command "AIM", whereupon the pupil performs the exercise as described above and then rests without further command. Then the exercise is repeated. The trigger is not squeezed in position exercises.

SIXTH DRILL PERIOD

POSITION EXERCISES (CONTINUED)

Subject	*Allotment of Hours*		*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 2 hrs.	B 2½ hrs.	
Explanation and demonstration. (Review)	¼ hr.	½ hr.	Pars. 19 to 24 both incl.
Assuming prone position rapidly.	¾ hr.	1 hr.	Par. 25*b*
Short skirmish run.	1 hr.	1 hr.	Par. 25

EQUIPMENT, *AREA*, and *TRAINING NOTES* are the same as previously stated.

THIRD STEP (TRIGGER SQUEEZE EXERCISES)

Subject	*Allotment of Hours*		*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 2 hrs.	B 3¼ hrs.	
Explanation and demonstration.	¼ hr.	¼ hr.	Par. 26
Trigger squeeze exercise, prone position, (sandbag optional).	½ hr.	1 hr.	Par. 26
Trigger squeeze exercise sitting.	¼ hr.	½ hr.	Par. 26
Trigger squeeze exercise kneeling.	½ hr.	1 hr.	Par. 26
Trigger squeeze exercise standing.	½ hr.	½ hr.	Par. 26

EQUIPMENT and *AREA* are the same as for position exercises.

TRAINING NOTES.

The procedure in the explanation and demonstration of the trigger squeeze exercises is similar to that prescribed for the position exercises. After the explanation and demonstration the men work in pairs as coach and pupil, changing places frequently. Emphasize the importance of this step. An "exercise" consists of the pupil assuming the prescribed position, holding the breath, taking up the slack, aiming and squeezing the trigger, and "calling the shot". The coach cocks the piece after each "shot". The exercise may be conducted at will, or controlled as described for position exercises.

SEVENTH DRILL PERIOD

TRIGGER SQUEEZE EXERCISES (CONTINUED)

Subject	*Allotment of Hours*		*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 1 hr.	B 2 hrs.	
Trigger squeeze exercises (Review).			
Explanation and demonstration.	¼ hr.	½ hr.	Par. 26
Trigger squeeze exercise, prone.	¼ hr.	½ hr.	Par. 26
Trigger squeeze exercise, sitting and kneeling.	¼ hr.	½ hr.	Par. 26
Trigger squeeze exercise, standing.	¼ hr.	½ hr.	Par. 26

EQUIPMENT and *AREA* are the same as for position exercises.

TRAINING NOTES are the same as for trigger squeeze exercises.

FOURTH STEP (TIME FIRE EXERCISES)

Subject	*Allotment of Hours*		*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 3 hrs.	B 4 hrs.	
Explanation and demonstration.	¼ hr.	½ hr.	Par. 27
Time fire cadence drill, prone.	½ hr.	1 hr.	Par. 27
Time fire cadence drill, sitting.	¼ hr.	½ hr.	Par. 27
Time fire cadence drill, kneeling.	½ hr.	½ hr.	Par. 27
Time fire exercise standing.	½ hr.	½ hr.	Pars. 27 and 43
Time fire exercise prone to prone, 25-yard rush.	½ hr.	½ hr.	Pars. 27 and 43
Time fire exercise prone to kneeling, 25-yard rush.	½ hr.	½ hr.	Pars. 27 and 43

EQUIPMENT and *AREA* are the same as for position exercises.

TRAINING NOTES.

The explanation and demonstration of cadence drill and time fire exercises are given as in the previous steps. "Cadence drill" may be conducted as follows: The men being paired off, coach and pupil, and in the prone position facing the 1,000-inch targets, the instructor commands: 1. Cadence Drill, 2. *COMMENCE FIRING.* The pupil aims at any figure and squeezes the trigger. Each time the hammer falls, the coach quickly cocks the piece by a sharp push on the operating rod handle. The pupil then promptly aims and fires again. This process is repeated until the command, *CEASE FIRING* is given. The men eventually acquire the ability to fire an aimed shot every two seconds. Each exercise continues for about one minute. This exercise is fatiguing to the coach and therefore coach and pupil change places frequently. The exercise is conducted in all positions and also after the 25-yard rush. The "Time Fire Exercises" are conducted in a similar manner but with the commands and time allowances used on the range and with the figures and targets prescribed in firing tables.

EIGHTH DRILL PERIOD

REVIEW EXERCISES

Subject	*Allotment of Hours*		*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 3 hrs.	B 4¾ hrs.	
Review of positions.	¾ hr.	¾ hr.	Pars. 19, 20, 21, 22, 23, 24
Trigger squeeze exercise, prone.	¼ hr.	½ hr.	Par. 26
Trigger squeeze exercise, sitting and kneeling.	¼ hr.	½ hr.	Par. 26
Trigger squeeze exercise, standing.	¼ hr.	½ hr.	Par. 26
Time fire exercise, prone to prone, 25-yard rush.	½ hr.	1 hr.	Pars. 25, 27, 43
Time fire exercise, prone to kneeling, 25-yard rush.	½ hr.	1 hr.	Pars. 25, 27, 43
Time fire exercise, standing.	½ hr.	½ hr.	Pars. 25, 27, 43

EQUIPMENT and *AREA* are the same as for position exercises.

TRAINING NOTES are the same as covered under position, trigger squeeze, and time fire exercises.

Subject	*Allotment of Hours*		*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 1 hr.	B 1¼ hrs.	
Effect of wind; sight changes; use of score book.	1 hr.	1¼ hrs.	Pars. 28, 29, 30, 31, and score book (See also Basic Field Manual, Volume III, Part One, Chapter 1, Section X, U.S. Rifle Caliber .30, M1903.)

EQUIPMENT.

Per man: rifle, score book, pencil.

Per platoon or company: 1 "D" target, 8 3-inch spotters, blackboard and chalk (desirable but not essential).

AREA.

Assembly room or outdoors.

TRAINING NOTES.

Explain the effects of wind, sight changes, and use of score book. Give problems in windage, using a spotter on the target to require sight changes and the use of the score book. It is essential that every man understand these subjects in order to avoid trouble later, when on the range.

NINTH DRILL PERIOD

REVIEW EXERCISES

Subject	*Allotment of Hours*		*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 4 hrs.	B 4 hrs.	
Trigger squeeze exercise, prone.	¼ hr.	¼ hr.	Par. 26
Trigger squeeze exercise, sitting and kneeling.	¼ hr.	¼ hr.	Par. 26
Trigger squeeze exercise, standing.	¼ hr.	¼ hr.	Par. 26
Time fire exercise, prone to prone, 25-yard rush.	¾ hr.	¾ hr.	Pars. 25, 27, and 43
Time fire exercise, prone to kneeling, 25-yard rush.	¾ hr.	¾ hr.	Pars. 25, 27, and 43
Time fire exercise, standing.	¾ hr.	¾ hr.	Pars. 25, 27, and 43
Effect of wind, sight changes, use of score book.	1 hr.	1 hr.	Pars. 28, 29, 30, 31, and score book.

The *EQUIPMENT*, *AREA*, and *TRAINING NOTES* for the conduct of these exercises are the same as previously covered for similar periods.

TENTH DRILL PERIOD

REVIEW EXERCISES

Subject	*Allotment of Hours*		*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 4 hrs.	B 4 hrs.	
Trigger squeeze exercise, prone.	¼ hr.	¼ hr.	Par. 26
Trigger squeeze exercise, sitting and kneeling.	¼ hr.	¼ hr.	Par. 26
Trigger squeeze exercise, standing.	¼ hr.	¼ hr.	Par. 26
Time fire exercise, prone to prone, 25-yard rush.	½ hr.	½ hr.	Pars. 25, 27, and 43
Time fire exercise, prone to kneeling, 25-yard rush.	½ hr.	½ hr.	Pars. 25, 27, and 43
Time fire exercise, standing.	¼ hr.	¼ hr.	Pars. 25, 27, and 43
Examination of all men by platoon leaders in all preparatory subjects and exercises.	2 hrs.	2 hrs.	Par. 32

EQUIPMENT is the same as for similar period plus the examination form (see Par. 32*d*, Basic Field Manual, Volume III, Part One, Chapter 1A). The *AREA* is the same as shown for similar period. *TRAINING NOTES* are the same except for the following addition: The examination is practical. Each man should be required to demonstrate his skill in the various exercises and to show his knowledge of the subject by his response to questions.

MARKSMANSHIP COURSES

The following schedules (A, B, C, and D) give the approximate time required to fire the several tables for the various courses prescribed in paragraph 34, Basic Field Manual, Volume III, Part One, Chapter 1A, dated 1938.

The course to be fired by an organization will be prescribed by higher headquarters. Prior to firing any of these courses the organization should receive mechanical training and preparatory marksmanship training as previously indicated. Firing without adequate preparatory training wastes time and ammunition, and will not produce satisfactory results.

The time schedules listed for the various tables are based on six orders per target. The time required for any table will be diminished or increased as the number of orders (number of men assigned per target) is less than, or exceeds, six. Four orders per target is ideal; six orders per target should be the maximum. If the number of men to fire, in proportion to the number of targets available, requires more than six orders per target, then the oganization should be divided into more than one group. Each group should have not more than six men assigned to a target.

The amount of firing that can be done in any allotted time depends entirely upon KEEPING THE TARGETS OCCUPIED. When men are not firing they should be engaged in some other profitable activity. However, it is not practicable to have men firing on the range engage in other training BETWEEN TURNS ON THE FIRING LINE.

1,000-INCH RANGE PRACTICE

In these schedules it may be noted that courses A, B, and C, include Fire Tables I, II, and III, on the 1,000-inch range. Course D is fired entirely on the 1,000-inch range.

Subject	*Allotment of Hours* *Based on 6 orders per target*				*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A	B	C	D	
	12 hrs.	12 hrs.	12 hrs.	18 hrs.	
Fire Tables I and II, each score preceded by a dry run for each man.	8 hrs.	8 hrs.	8 hrs.		Pars. 34 to 45 incl., 78 to 88 incl.
Fire Table III	4 hrs.	4 hrs.	4 hrs.		
Course D:					
Fire Tables XVI and XVII.				5 hrs.	
Fire Table XVIII.				3 hrs.	
Fire Table XIX.				6 hrs.	
Record Practice:					
Fire Table XX.				4 hrs.	

EQUIPMENT

Per man: Rifle, 2 clips, elbow pads, shoulder pad (optional), score book, score card, pencil, 2 M1 1,000-inch paper targets.

Per target: Field glasses, sand bag (optional).

Per squad: Sight blackening material, cleaning and lubricating material, cleaning rod, combination tool (advisable).

Per company: Ammunition, for Tables I and II, 24 rounds per man; for Table III, 40 rounds per man; containers (boxes or sacks) for empty cartridge cases, score board (advisable), 1 folding table per each 3 or 4 targets (a convenience), target frames, paste for pasting down corners of paper targets, clip loading machine (advisable).

AREA.

See Figure 86.

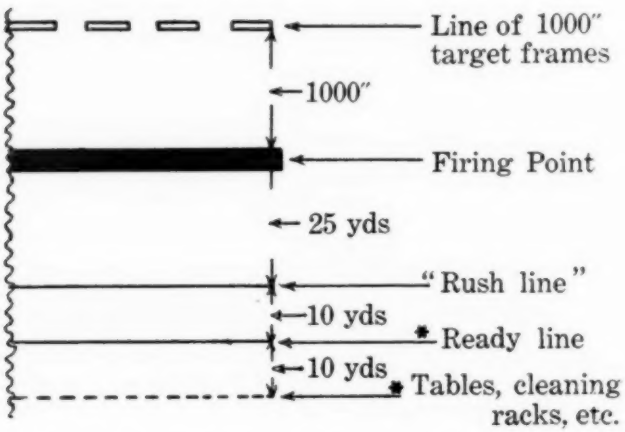


FIGURE 86.—Organization of area for 1,000-inch firing.

TRAINING NOTES.

Prior to arrival on the target range the officer in charge of firing should see that the range is ready and that the necessary pit details have been provided to insure that firing will proceed as scheduled. In time fire, he should require that the targets be fully exposed for the specified length of time. He must be familiar with the fire orders laid down in paragraph 44.

Timely arrangements should be made for the conduct of record practice. For scoring in the pits there should be provided: one officer for each four targets (maximum), one noncommissioned officer for each target, and the necessary pit record cards. At the firing line there should be the individual score cards and one scorer for each target. The officer in charge of firing is responsible that all concerned understand and comply with the "Rules Governing Record Practice".

The organization commander should see that during instruction practice each man records the zero of his rifle for each range as prescribed in paragraph 42*b*. He should provide experienced coaches for all backward men.

Present ammunition allowances do not permit all men to fire all the Tables shown for any particular course, because men who are re-qualifying have reduced allowances. For Course C, the ammunition allowance does not provide sufficient ammunition for the four zeroing rounds at 200 yards prone. Sufficient ammunition for this purpose may be saved by omitting a portion of Table III. It is a good practice to "pool" the allowance of ammunition and allot it as thought necessary for best general results.

KNOWN DISTANCE RANGE PRACTICE

Subject	*Allotment of Hours Based on 6 orders per target*			*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 24 hrs.	B 20 hrs.	C 16 hrs.	
Instruction Practice (Course A).				Pars. 34 to 42 incl., 44, 45
Fire Table IV (each score preceded by dry run).	12 hrs.			
Fire Table V (each score preceded by dry run).	4 hrs.			
Record Practice (Course A)				Pars. 46 to 77 incl.
Fire Table VI.	5 hrs.			
Fire Table VII.	3 hrs.			
Instruction Practice (Course B)				Pars. 34 to 42 incl., 44, 45
*Each man fires 4 shots prone, 200 yards, to zero rifle.		1 hr.		
Fire Table VIII (each score preceded by dry run).		7 hrs.		
Fire Table IX (each score preceded by dry run).		4 hrs.		

KNOWN DISTANCE RANGE PRACTICE (*Continued*)

Subject	*Allotment of Hours* *Based on 6 orders per target*			*Text References* (Basic Field Manual, Volume III, Part One, Chapter 1A)
	A 24 hrs.	B 20 hrs.	C 16 hrs.	
Record Practice (Course B)				Pars. 46 to 77 incl.
Fire Table X.		4 hrs.		
Fire Table XI.		4 hrs.		
Instruction Practice (Course C)				Pars. 34 to 42 incl., 44, 45
*Each man fires 4 shots prone, 200 yards, to zero rifle.			1 hr.	
Fire Table XII (each score preceded by dry run).			7 hrs.	
Fire Table XIII (each score preceded by dry run).			4 hrs.	
Record Practice (Course C) Tables XIV and XV.			4 hrs.	Pars. 46 to 77 incl.
**Not prescribed in firing tables but essential.*				

EQUIPMENT.

Same as for 1,000-inch practice except ammunition and target material.

Ammunition per man: Table IV, 40 rounds; Table V, 32 rounds; Table VI, 12 rounds; Table VII, 32 rounds; Table

VIII, 24 rounds; Table IX, 32 rounds; Table X, 8 rounds; Table XI, 32 rounds; Table XII, 20 rounds; Table XIII, 24 rounds; Table XIV, 4 rounds; Table XV, 24 rounds.

For record firing: Record Score Cards, one indelible pencil per scorer, one Pit Record Card per target, one indelible pencil per scorer in pit.

Range equipment: Telephones, rifle racks, cleaning racks, scoring benches or tables, "D" targets pasted on frames, sixteen 3-inch spotters per target; one 6-inch spotter per target; red flags, marking discs, pasters, paste.

AREA.

See Figure 87.

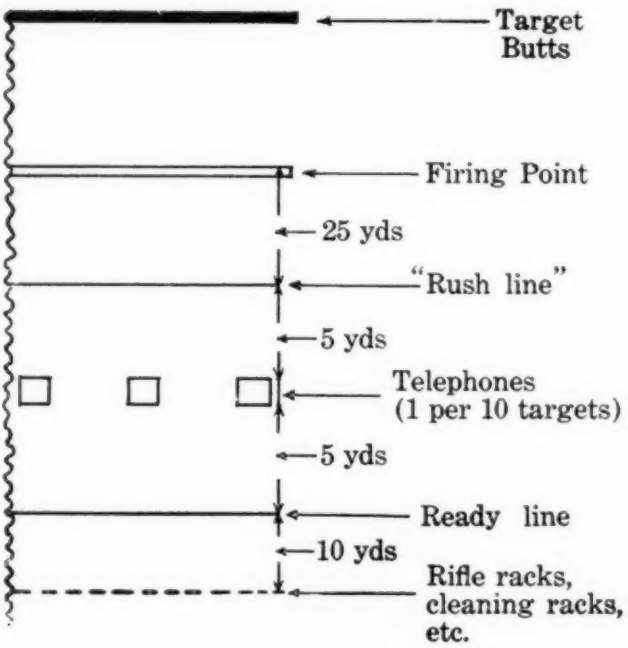


FIGURE 87.—Diagrammatic sketch showing method of organizing firing line area.

TRAINING NOTES.

The organization commander should assign men to targets, preferably not more than six orders to a target, prior to arrival on the target range. The duties of the coaches are prescribed in paragraph 41 of the Basic Field Manual and should be emphasized. As part of this emphasis the provisions of paragraph 41*d* "substitute for dummy cartridges", and 41*e* "coach squeezing trigger" should be demonstrated to and practiced by all coaches. In exercises involving the short rush the coach rushes with the pupil. The unit commander should require all firing to proceed expeditiously but should avoid hurrying the firer. Successive orders should be prepared for firing while on the "ready line" and should move promptly to the firing line when the preceding order finishes its firing. Each rifle will be zeroed for the 1,000-inch range as covered in paragraph 42. The officer in charge of firing must be familiar with the fire orders laid down in paragraph 43, and should explain and rigidly enforce all safety rules. When firing is conducted on an open range, where no pits are available, the first order should complete firing Tables I and II before leaving the firing line. The targets should then be changed and the second order should fire the same tables. When all orders have fired both Tables I and II, then proceed to Table III. Each order should fire all of Table III during one period on the firing line. The schedule of firing shown in this chapter is applicable to firing an organization when all men are unqualified.

Ammunition allowances for Courses A, B, and D, provide more ammunition than necessary for firing the specified tables. The extra ammunition should be used during Instruction Practice at the discretion of the company commander. Ammunition allowances and minimum scores for qualification are prescribed in Army Regulations 775-10.

CHAPTER 9

Caring for Our Wounded

(AN INFANTRY SCHOOL TEACHING)

Wounded men are necessarily a part of all our battles. Regardless of the units involved, the tactical formations undertaken, or whether we win or lose—we will always have battle casualties.

Instruction in Medical Service at The Infantry School is concerned mainly with the medical service of the infantry regiment. The new organization of the regimental medical detachment (War Department Tables of Organization 7-14, effective January 1, 1939) includes a Headquarters, a Headquarters Section, and three Battalion Sections.

The personnel and functions of the war-strength detachment are as shown below:

(1) Headquarters (Regimental Surgeon's Office):
Major ..... Regimental Surgeon
Captain (or 1st Lieutenant) Dental Corps
..... Assistant Regimental Surgeon
Technical Sergeant ..... Acting 1st Sergeant and in charge of property
Chauffeur, clerk, dental technician and a sanitary technician.

The increased mobility of the new regiment makes more imperative than ever the inclusion of the regimental surgeon as an active member of the regimental commander's staff. The surgeon must keep himself informed of the plans for the employment of the units of the regiment, of the hostile opposition the various elements are expected to meet, and of the terrain over which they will operate.

T/O 7-11

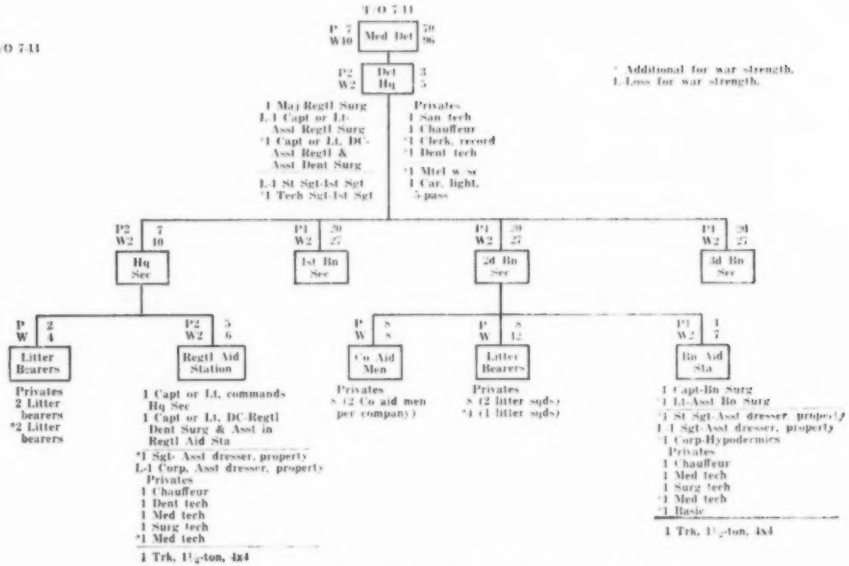


FIGURE 88.—Medical Detachment, Infantry Regiment.

(2) Headquarters Section:
Litter Bearer Squad (four enlisted men)
Regimental Aid Station Squad (two officers (one dental), six enlisted men).

This personnel should be charged with litter bearer and aid station service for elements of the regiment which are not a part of or serving with one of the battalions; and with service for units held in regmiental reserve until they are committed (thus, when the reserve is ordered into action, its attached medical personnel can accompany it, without the delay occasioned by turning wounded over to some other medical unit).

The litter bearers carry seriously wounded to the regimental aid station. They also constitute the reserve of medical enlisted men available to the regimental surgeon for reinforcing battalion medical sections and replacing their losses.

The regimental aid station will ordinarily handle fewer casualties and is therefore allotted a smaller number of enlisted men than is required by the battalion aid stations.

(3) 1st Battalion Section (2d and 3d Battalion Sections have the same strength and organization):
Company Aid Squad—eight enlisted men (two company aid men per company).
Litter Bearer Squad—twelve enlisted men. Using four bearers per litter, this squad can evacuate but three seriously wounded patients per trip.
Casualties among company aid men and litter bearers are numerous. Their duties are such that they may be used interchangeably, but losses in battalion medical sections must be replaced quickly.
Aid Station Squad—two officers (both of the Medical Corps) and seven enlisted men.
This is the minimum team capable of furnishing efficient aid station service to a battalion and such additional elements as may be expected to serve in the area of the battalion.

The regimental medical detachment (war strength) includes two officers of the Dental Corps. Their knowledge of anatomy and surgical technique permits their assignment as assistant surgeons. They are used as specialists in handling jaw cases, and they dress all types of wounds.

The essential characteristics of the medical service are emphasized at The Infantry School by including suitable instruction in all appropriate demonstrations, conferences, map problems, and terrain exercises. During field exercises and maneuvers, infantry student officers are assigned as regimental and battalion surgeons. During the final school maneuvers there is used a war-strength regimental medical detachment, lacking only the regimental and battalion surgeons. Student officers are charged with the command and staff functions of those two medical officers. The assistant surgeon at each aid station, being a medical officer, is responsible for the treatment of casualties. Thus the student must get from the staff all information which is required by the unit surgeon. He must make his own reconnaissance, plan the distribution of his medical unit, recommend the site for the aid station, and keep in touch with the tactical plans so as to conform to them. All of this impresses him with the fact that the tactical handling of the medical detachment is based upon and coordinated with the tactical plans of the regiment, and that with the small number of men available, careful planning is necessary to insure efficient medical service. Infantry officers need this experience since commanders of all units are responsible for the efficient operation of the medical service within their organizations (Field Service Regulations, paragraph 679), and the S-4 of the infantry regiment is charged with coordinating medical service activities with other activities. It is necessary that he have a very clear conception of the task confronting the medical service, and of the organization, strength, powers and limitations of the troops available to render that service.

During field exercises and maneuvers realism is added by actually handling simulated casualties. Wounded are designated by umpires. These wounded receive first aid

from company aid men; if seriously wounded they are carried to the aid station by litter bearers and there treated by the assistant surgeon (the medical officer) and the aid station squad. All this can function properly only if the student officer has correctly estimated the situation from the viewpoint of the surgeon and correctly distributed his limited personnel. Finally, to make it more than just play-acting, the only medical personnel that is taken into the field consists of the medical detachment of the maneuver regiment. Each student acting as a surgeon is informed that any actual casualties occurring in his unit will be handled by his medical section. The student is less likely to overlook medical service for some part of his unit, the outpost for instance, when he realizes that a casualty may be really sick or injured.

Let us accompany a class at The Infantry School and witness a demonstration of the Medical Service of an Infantry Regiment in the attack. This chapter describes the actual conduct of the demonstration. It furnishes a practical guide for the organization and conduct of simliar demonstrations.

The class is conducted east on the First Division Road to its junction with Buckeye Road. They are then led east to a point on the railroad just north of the highest part of Turner Hill. The 1st Infantry command post is being set up under the trees on the north slope of Turner Hill and just downhill from the railroad.

INSTRUCTOR: "Gentlemen, The demonstration today will show the medical service of an infantry regiment in the attack. You will see and hear: (1) the personnel of the Headquarters Section of the Medical Detachment as they plan to handle the battlefield casualties; (2) what the company aid men can do for the wounded on the field; (3) the litter bearers bringing the more serious cases to a battalion aid station; (4) the care of the wounded in the station; and, finally, a bird's-eye view of the entire divisional medical service.

"You are now facing north, about two hundred yards east of the junction of the First Division and Buckeye Roads."

SITUATION

INSTRUCTOR: "This morning the Blue 1st Division drove a Red brigade toward the southwest to a position about 1,000 yards south of here, the position is partially shown on the operation map (see Figure 89). The boundaries between units, line of departure, and disposition of the 1st Infantry, an interior regiment of the division, are as indicated on the map.

"It is now 10:30 AM and a part of Headquarters 1st Infantry is operating at an advanced regimental command post. You can see S-3 working at his maps. S-1 is just arriving. The regimental surgeon's office, consisting of two officers and five enlisted men, is a part of regimental headquarters. The regimental surgeon is now conferring with S-3. Over here, (points) the Acting 1st Sergeant of the Medical Detachment, the clerk, and the sanitary technician have brought in the medical chest and are setting up the regimental surgeon's office. They arrived on the motorcycle and the regimental aid station truck, which is now concealed in the woods 150 yards to the northwest. The office equipment is all in this chest, which weighs 145 pounds. Let's hear the regimental surgeon's estimate of the situation."

REGIMENTAL SURGEON: (Brings his map over to his office and speaks to his assistants.) "Here's the situation. Red has taken up a position on the hill 400 yards north of Jordan Hill—the edge of the 127th Infantry Woods—the spur running northwest to Sackett Hill. He has another line based on Hamilton Hill and Lee Hill about 1,000 yards farther south. The strongest part of his position is on the east flank including Jordan Hill, Jobes Hill, and Hamilton Hill. We resume the attack at 11:00 AM, with the 1st and 2d Battalions in assault, 1st Battalion on the left, line of departure right along here (indicating).

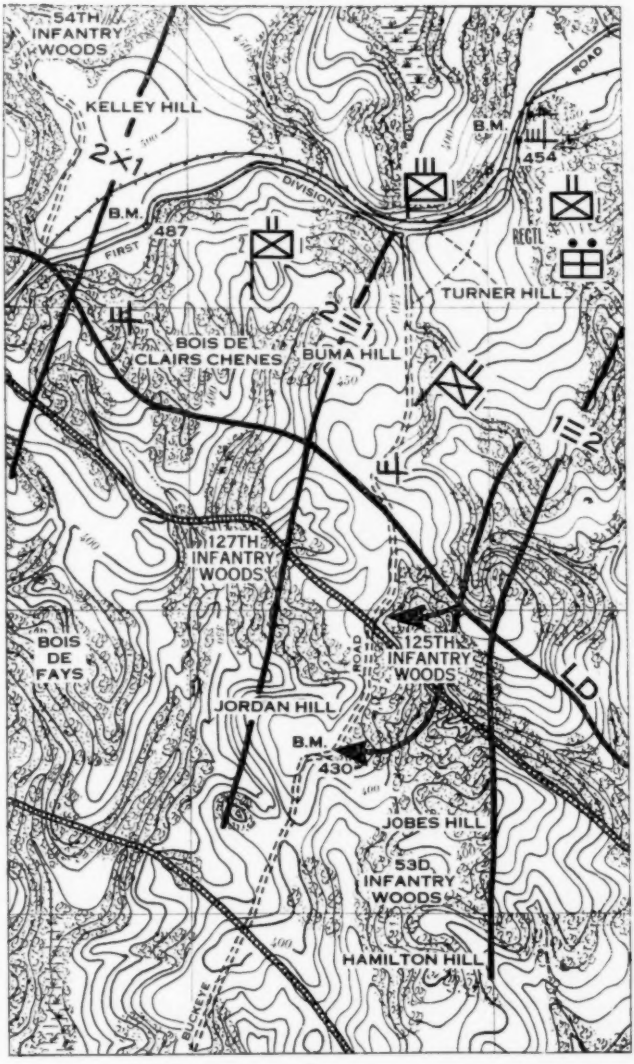


FIGURE 89.—Operation Map, 1st Infantry.

We make our main effort through the 125th Infantry Woods against Jordan Hill and the hill 400 yards north of it. The 1st Battalion, besides making the main effort of the regiment, has some nasty open ground to cross; it will get most of the casualties, especially along the left of the regimental zone; the 2d Battalion will be in heavy woods and the swampy valley of McMurrin Branch; it will have fewer casualties and they'll be scattered. The 3d Battalion is back here in the 52d Infantry Woods in regimental reserve. Everything clear so far?

"All right then, I want the regimental aid station to serve this command post and the 3d Battalion as long as it's in regimental reserve. (Turns to 1st Sergeant.) Did you leave the regimental aid station truck back there with my car? (1st Sergeant nods.) Well, take it up to the north end of the 52d Infantry Woods, just around the curve (pointing) and across the First Division Road. You can reach it in the truck. Inform the squad of the situation and tell them to establish station in the draw nearest the First Division Road, if they get any casualties, and be prepared for an early move forward; this attack is going places. Contact the Surgeon 3d Battalion, tell him where the regimental aid station will be and that it will serve his battalion as long as it's in regimental reserve. I'll get the regimental headquarters to inform the Commanding Officer 3d Battalion, but I want his surgeon to know about it in the meantime. Find out how many men his section lost in the fight this morning and let me know. If he hasn't asked for replacements, tell him I'll attend to that. I want that section to get as much rest as they can.

(To the class.) "I have already sent the assistant regimental surgeon to the 1st Battalion. They'll need him all the rest of today.

(To the 1st Sergeant.) "Now let's see. Sergeant, you and the sanitary technician have just finished checking up on the supplies in the aid stations. What did you find?"

FIRST SERGEANT: "Supplies in the 1st and 2d Battalion aid stations are practically intact; the 3d Battalion

aid station needs litters, blankets, and about one day's supply of small and medium dressings. The regimental aid station has used very little. The Regimental Supply Sergeant of the 1st Infantry tells me that there are 200 pounds of medical supplies for us back at the 1st Infantry Distributing Point."

REGIMENTAL SURGEON: "Well, that's pretty good news. Looks like the division medical distributing point is sending us supplies before we ask for them. That's something that never happened back at our home station. Maybe that's what they mean in the service schools when they say: the impetus of supply is from the rear. Now then, Sanitary Technician, use the motorcycle and deliver 75 pounds of those supplies to the 1st Battalion aid station, 25 pounds to the 2d Battalion aid station, and keep the rest at the regimental aid station."

FIRST SERGEANT: "How about giving some to the 3d Battalion section? They are pretty low on a number of items."

REGIMENTAL SURGEON (To Sanitary Technician): "No, hold them at the regimental aid station and we'll be prepared to send them where they are needed the most. (Sanitary Technician salutes and exits right.)

"First Sergeant, as soon as the regimental aid station arrives at its site report back here to me. (First Sergeant salutes and exits right.)

"Clerk, make another copy of this operation map. I'm going over to S-3 and make sure the site of the regimental aid station is included in the regimental attack order."

We have listened to the Regimental Surgeon planning the use of his medical personnel and equipment. The attack will soon start. We are going to move south on the Buckeye Road to the line of departure.

THE ATTACK

The student officers are led to the position marked "X" on Figure 90.

INSTRUCTOR: "It is now 10:57 AM. You are on the Blue line of departure, about in the center of the zone of the 1st Battalion 1st Infantry. The line of departure of its right company extends along this nose toward the northwest. Remember, we can see only a fragment of the action, as the line of departure extends far to the right and left. We will be afforded a close-up view of the leading platoon of the right company. Before the attack started the Battalion Surgeon sent two company aid men to report to this company. The Company Commander allotted both of them to his leading platoon. That platoon must cross the open ground in front of you.

"The portion of the Red brigade opposing the 1st Battalion is occupying that hill (pointing), which is the hill 400 yards north of Jordan Hill; that shoulder extending to the northwest and the 127th Infantry Woods (pointing). In this demonstration the Red position will be indicated by two machine guns. Notice that Red has observation and a splendid field of fire across this open ground.

"It is now 11:00 o'clock. (Signal to a hidden Blue scout, who takes word to the platoon commander to attack.)

"The assault platoon can be seen moving through the trees and bushes toward the line of departure. Blue scouts crossing the line of departure are observed by the enemy. Red machine guns open fire on Blue targets as they are presented. The scouts take cover and return the fire. As the Red machine guns go into action Red artillery opens fire. These are scattered shots, apparently Red's attempt to break up the attack near the Blue line of departure. Smoke puffs appear on the high ground to our right as enemy white phosphorus (smoke) shells seek to blind the aim of Blue machine gunners.

"Blue light machine guns are going into action; they engage the Red machine guns as the first squads cross the line of departure. Red artillery fire increases in intensity

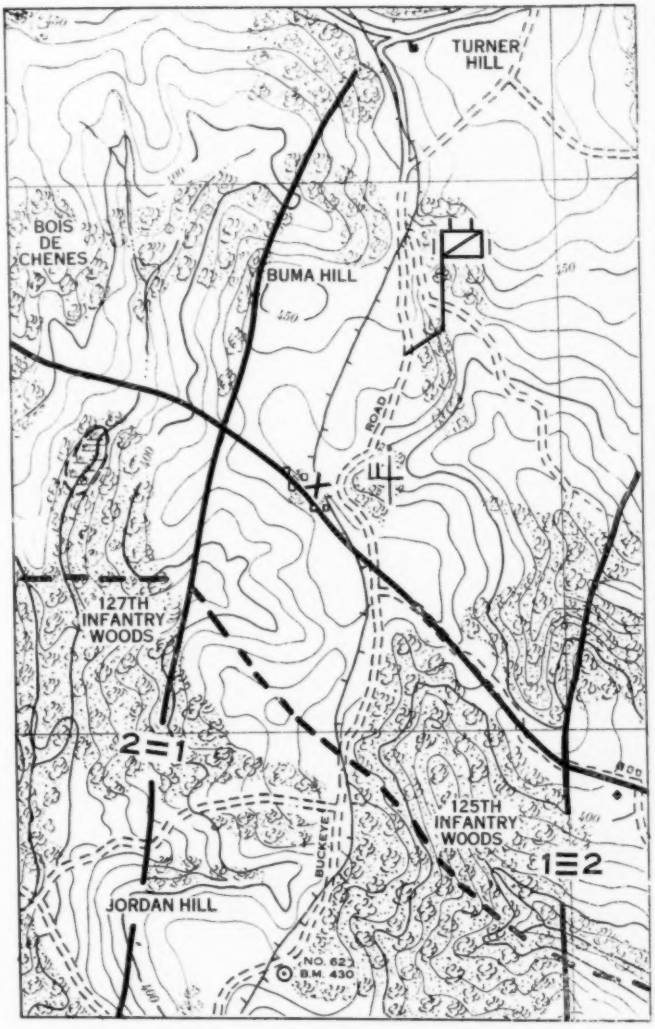


FIGURE 90.—Terrain in 1st Battalion area.

as a Red battery lays down its normal barrage immediately in front of the Red position. (Red artillery: a salvo of four shots with one-second intervals, across front of Red position; followed by a second salvo.)

"The assault platoon is now crossing the open field by squad rushes. One of our men is hit. From here it looks like a chest wound. There's another, shot through the leg. The company aid men can be seen following the first squads.

FIGURE 91.—Company aid man applying dressing under fire.

They reach the wounded men by short rushes. They are under the same fire as the infantrymen. That one is applying a first aid dressing. He makes out an Emergency Medical Tag and fastens it to the wounded man's clothing. He draws the man to a less exposed site, marks his location with a bit of bandage on some weeds—in case all the wounded aren't found by litter squads by nightfall. Look! That man nearest you has just been shot through the hand. Still holding his gun he starts running to the rear."

INSTRUCTOR: "Watch that man (points). When his squad is ordered to rush he is always the last one up. Several times he has hit the dirt before his squad was ordered Down."

After the rush that carries him past the last of the student officers, the malingerer starts slowly towards the rear, crouching. A sergeant orders him toward the front, but the malingerer continues rearward, yelling "I'm sick." The sergeant moves to block him, and the malingerer starts to run. The sergeant drops on one knee and simulates firing at the man. The malingerer runs over the hill as fast as he can go. Other men are wounded. Near that bush (pointing) a man stumbles, drops his rifle, and grasps his left arm; another comes to a sudden spasmodic stop, then doubles up and pitches slowly face downward; another spins around and crumples as he is shot through the head.

All the while the company aid men are working among the wounded, directing the walking wounded to the battalion aid station, dressing the seriously wounded and marking their positions.

BATTALION AID STATION

INSTRUCTOR: "We will now go to the location of the 1st Battalion Aid Station to see what can be done for our wounded at the closest medical installation to the front. It is located in the small patch of woods about 50 yards east of the Buckeye Road. (See Figure 90.) (As we approach the station we can see that it has been set up and the personnel is preparing to receive the wounded.)

"The Battalion Medical Section, less the Battalion Surgeon (who at this time is at the Battalion Command Post) and the Company Aid Squad, plus the Assistant Regimental Surgeon and his enlisted assistant, are at the station. The battalion medical truck is under cover 20 yards northeast of the station. Three screens of foliage have been erected; one south and one north of the station, hiding the patients waiting to be sent into the station; the third screen is northeast of the station, just beyond the truck to hide the patients

sent to the collecting station. Each screen has a noncommissioned officer to supervise the patients.

"This is the aid station of the 1st Battalion 1st Infantry. The Battalion Surgeon, from information gained at the Battalion Command Post and from his own reconnaissance, made an estimate of the situation. His estimate was probably in more detail than the Regimental Surgeon's, which you heard. The Battalion Surgeon was particularly concerned with probable lines of drift of the wounded. He decided that most of the casualties would fall in the left portion of the battalion zone, where the main effort of the regiment is made. Another group would be in the open field on the right, over which you saw the platoon attack. He chose this site as being at the junction of the lines of drift from those areas. Since he does not expect many casualties until the battalion crosses the line of departure, he chose a site as near that line as concealment and cover from the direct fire of small arms could be found.

"The site does not have water, but battalion aid stations cannot always find that. Water for the wounded at this aid station will be brought in five-gallon milk cans or other man-handled containers. The surgeon having chosen this site for the aid station, recommended it to the battalion commander. The decision as to the location of the aid station rests with the battalion commander.

"Let us take a moment to look at the equipment of the medical enlisted men (one man steps forward, facing the class. Assistant Battalion Surgeon points to the articles of

FIGURE 92.—Individual equipment of Medical Enlisted Man, front view.

equipment as they are described.) He wears a pistol belt and a web suspender (man does about face so that his back is toward the class) allowing full field equipment to be

carried (man does about face, to face the class). The pouches contain field dressings, iodine swabs, a small case of instruments, and a book of emergency medical tags. The tag shows the name and organization of the wounded, the

FIGURE 93.—Individual equipment of Medical Enlisted Man, rear view.

nature of the wound, and the treatment given. It is made out and affixed to the patient's clothing by the first medical man that sees him. The pouches are capable of being extended to twice the usual size. The pouch under the man's

right arm is the usual size; that on his left has been extended, the additional space being used for extra dressings. These are issued in the assembly area at the same time that the infantryman is being issued extra ammunition. With both pouches extended a man can carry 30 individual dressing packets, each packet containing two dressings similar to the one carried in a first aid packet.

"The first aid packet, in its pouch, is carried in the field by every enlisted man and officer. Those of you who have had experience in opening the old type of first aid packet will recall that the instructions printed on the metal cover said: To open, pull the ring. The two halves of the cover were soldered together, and the ring usually came off in your hand. Unless your wound was very slight you were unable to get at the dressing without the use of a meat axe or a stick of dynamite. The Assistant Battalion Surgeon now holds the new type of packet known as the Carlisle Model. It is the same size as the old one but the halves of the cover are not soldered, but are held together by a light strip of metal which is crimped in place. The Lieutenant will show you how it is opened. (He opens packet by holding the ring in his teeth and pulling on the cover with one hand.) The contents are the same as in the old model—a dressing of sterile gauze in a waxed paper envelope. (Assistant Battalion Surgeon demonstrating.) Tear open the envelope and grasp the dressing by the colored paper. Shake out the bandages which are sewed to the dressing and then grasp them, opening out the folded dressing. The inner side of the dressing, the side that you have been so careful not to touch, is then applied to the wound and the dressing fastened on by tying the bandages together.

"The personnel at the aid station consists of (each holds up his hand briefly, as the instructor announces his title):

The Assistant Battalion Surgeon, a first lieutenant, Medical Corps—(At this time the Battalion Surgeon is at the Battalion Command Post.)

One Staff Sergeant, section leader, surgical assistant and dresser and in charge of property.

One Corporal, assistant dresser, sterilization of instruments, hypodermics.

One Private, works with the Battalion Surgeon.

One Private, prepares the sick blotter.

One Private in charge of water and food for the patients and works with the Assistant Battalion Surgeon.

One Private, chauffeur, in charge of the medical truck.

One Private, general utility man.

"These enlisted men compose the aid station squad. There is also present a litter bearer squad of twelve privates (litter bearers wear medical pouches but no packs). These men carry the seriously wounded from the field to the aid station. Litter carriage is fatiguing work and casualties among bearers are numerous. It may be necessary to augment this squad by detailing prisoners of war, bandsmen, or even riflemen to assist in carrying the wounded from the field. Riflemen should not be detailed on such duty until all other means have proved inadequate.

"At the station we also find the Assistant Regimental Surgeon, a first lieutenant, Dental Corps, and his enlisted assistant, both from the regimental surgeon's office. This officer is a most important individual in assuring prompt service at the aid station. The two medical officers assigned to each battalion aid station are barely adequate to attend the normal number of wounded. If the battalion meets strong resistance, or if it receives the major thrust of the enemy's attack, two officers will prove inadequate and wounded will accumulate at that aid station. Before combat begins the regimental surgeon should determine which aid station will probably receive the greatest number of

casualties and send his assistant to help in that aid station. He should be sent in time to familiarize himself with the local situation.

"The addition of a third officer just about doubles the rate of caring for wounded at an aid station. When it is remembered that frequently the bulk of the wounded in a regiment come from but one battalion, the importance of

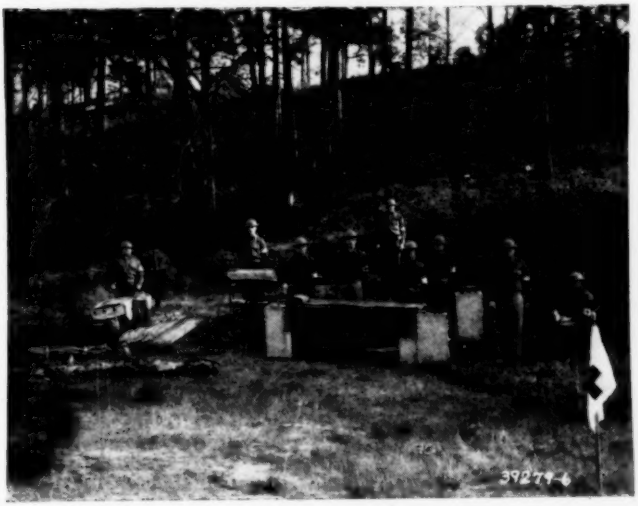


FIGURE 94.—Battalion medical chests and equipment.

this individual in preventing the accumulation of untreated casualties at the aid station can be seen. Later we will see that he attends all the face and jaw cases and also that he dresses his full share of all other types of wounds.

"The equipment of a battalion aid station formerly weighed about 2,000 pounds. It has been reduced and now consists mainly of three chests, together weighing less than 400 pounds (392 pounds—2 chests—No. 1 equals 242 and

chest No. 2 equals 150). Each chest is made of metal and is a little larger than a locker trunk. The contents are dressings, instruments, and medicines, all arranged in trays which, when lifted out, form instrument shelves. The empty chests standing on end support the ends of a litter which then becomes the operating table. Other equipment includes the sterilizer with alcohol burner, splints, blankets in canvas cases, a water sterilizing bag, and a number of litters. These items are bulky but not very heavy. There are two types of litters at this station. This (pointing) is an old model litter with oak poles. It weighs 24 pounds. This is the new model, same size, same strength, but is has aluminum tubes in place of oak poles, and wooden handles are inserted in the ends of the tubes. Its weight is 14½ pounds. All this equipment and the aid station personnel are carried on the medical truck.

"The contact agent from the collecting company which evacuates this aid station can now be seen arriving. He reports to the Assistant Battalion Surgeon. This man serves in a liaison capacity between the aid station and the collecting station. The surgeon insures that the contact agent is oriented, and has the position of the aid station located on his map. He points out the best route to the rear and tells the contact agent that they will need evacuation as soon as he can get his collecting company litter bearers up. The contact agent salutes and moves to the rear by the indicated trail.

"The Battalion Surgeon now arrives and directs the Assistant Battalion Surgeon to send the litter bearers out along the two probable lines of drift for the prompt collection of casualties. The Assistant Battalion Surgeon sends four bearers and one litter to the south screen and eight bearers and two litters toward the north screen. At the same time the Battalion Surgeon sends a message to the battalion commander, by the utility private, stating that the aid station is established and ready to function.

"The first wounded man walks into the station. This is the man with the wounded hand. The surgeon examines it and finds that it is a slight wound involving several of the

fingers. He puts on a dressing while the corporal injects anti-tetanus serum. Listen to the surgeon talking to him."

SURGEON: "That's all right. What about it, do you want to go back to your company?"

WOUNDED MAN: "Yes sir, I want to get that bird that hit me."

SURGEON: "Wait over there, you can go with the next litter bearers."

As the surgeon talks to this man there arrives a litter case, being carried head first from the north screen.

INSTRUCTOR: "A litter case is coming in. Notice that he is being carried down the hill, head first, because he is

FIGURE 95.—Transferring wounded man from litter to litter operating table.

wounded in the leg; in that way the weight of his body does not press against the wounded part. He is placed on the litter operating table and examined. The corporal is giving him a hypodermic of anti-tetanus serum. This injection, which we call A. T. S., is for the prevention of lockjaw; it

is given every wounded man at the first medical installation which handles the case. The surgeon has determined that this patient has a fractured femur—the thigh bone. (Aid Station Squad starts applying a leg splint.) Before the World War, fractures of this bone were extremely serious, especially during the period of their evacuation. There is considerable surgical shock in any fracture of a large bone. If it is necessary to transport the case, shock is increased by the movement of the bone fragments against each other, and against the other tissues. Ordinary splints helped very little and many of these cases died in the ambulances. The Thomas leg splint which the surgeon is applying prevents a great deal of the shock. It saved many lives in the last war. It is made of heavy wire, supports the entire length of the leg, raises it slightly so as to relax the muscles and, most important of all, it allows traction to be exerted and maintains that traction and so minimizes the damage from the broken ends of the bone.

"The utility private, having delivered the surgeon's message to the battalion command post, returns to the aid station. On the left two litter bearers are preparing what we call a dressed litter. Two blankets are so arranged on a litter that there will be four layers below and two above the patient, with sufficient blanket left over to tuck in at the sides. Warmth is important in the treatment of shock. A third blanket becomes a pillow.

"Litter cases are treated and then set outside the station awaiting evacuation by bearers from the collecting station. The leg case now has a traction splint, his weight can't press against the wounded part. He will be more comfortable now if his head is up-hill.

Another wounded man can be seen being carried feet first down the hill. This man has a gun-shot wound of the right chest. He is placed on the litter table, his wound dressed, he is given A. T. S. (anti-tetanus serum) and placed outside the station.

"Slightly wounded patients are treated and returned to the front, or told to walk back to the collecting station.

The man with the wounded fingers is now sent back to his company with the litter bearers.

"An infantry runner from Company B now arrives with a note from the company commander, stating that one of his company aid men has been killed. He asks for replacement. The Battalion Surgeon sends the utility private with the runner back to Company B. (They exit toward the south screen.) A message is then sent to the regimental surgeon, by the driver of the medical truck, asking for a replacement."

As a litter bearer squad approaches the station they call "Gas case". The patient's collar is buttoned very tight—he holds his breath and swells the muscles of his neck against his collar.

INSTRUCTOR: "This man was incapacitated by inhaling phosgene gas. Gas cases of this type fall into two classes: gray cases and blue cases. In the gray case the man is suffering serious shock, with subnormal temperature, cold clammy skin, and an ash-gray appearance. But this man is a blue case. His face is suffused or cyanotic, his skin is hot and dry, and his temperature and pulse are elevated. Bleeding the patient causes the blue cases to improve very rapidly. The surgeon is now opening a vein in the bend of the man's elbow; he will let out a pint or so of blood and you will note that the soldier's color returns to normal." (The corporal at the aid station loosens the patient's collar as bleeding takes place.)

"The surgeon has the litter bearers put this gas case on the other side of the aid station, well away from the other wounded."

A walking case enters the aid station, his sleeves are rolled up, he is holding his arm well away from his body. His arm is spotted with mercurochrome.

INSTRUCTOR: "This man was wounded by being burned on the forearm by white phosphorus. He was struck by very small particles of the chemical, each particle burning its way through his clothing and into the skin. It was extremely painful at first, but soon the bits of chemical became coated with an inert oxide. At present he is suffering

very little, but should his clothing touch any of the phosphorus, the oxide would be rubbed off and the burning would start all over again. The man's arm is washed with three per cent copper sulphate, the black deposits are picked out, the arm is dressed, and the man is instructed to walk to the collecting station. The route is pointed out to him.

"The contact agent can now be seen returning from the collecting station leading two litter squads. He reports to the battalion surgeon who designates the cases to be evacuated first. The surgeon directs him to replace, on the return trip, the blankets and splints which are evacuated with the patients. When cases are evacuated from an aid station, the litters, blankets, and splints go with them. If not replaced, this would soon deplete the limited store of such articles at the aid station. On their return trip the Collecting Company litter bearers replace this equipment automatically by leaving the same number of articles. This is known as the litter, blanket, and splint exchange. (Bearers exit, carrying leg and chest cases.)

"Note that the contact agent remains at the aid station.

"Another litter case enters from the north. (Rifle with fixed bayonet and helmet are on the litter. This man is very pale: one limp arm hangs over edge of litter.) This case is a gun-shot wound of the abdomen."

The surgeon examines him, packs the wound, calls for a stethoscope, shakes his head, and states slowly:

SURGEON: "This man is dead. Put him over there."

The bearers take him to one side of the station and roll him off the litter, jab his fixed bayonet in the ground, and put his helmet on the butt of his rifle. As these bearers return to the front a malingerer enters from the north.

MALINGERER: "OH-O-O-O-O!"

He starts toward the aid station, walking, dragging his rifle, and limping. One legging is partially unwrappd, and his helmet is gone.

Malingerer approaches the aid station, audibly suffering worse than ever.

SURGEON: "Get up on the litter."

MALINGERER: "I can't do it (but he does)."

SURGEON: "Well, where's the trouble?"

MALINGERER: "My belly. I'm *awful* sick."

The surgeon examines the malingerer's abdomen. The Malingerer groans and pulls up one knee.

SURGEON: "Your knee hurt too?"

MALINGERER: "Oh yessir, I can't walk."

Surgeon examines knee: malingerer groaning. The Surgeon looks from knee, to abdomen, to malingerer's face; then while examining knee the Surgeon presses on malingerer's stomach.

MALINGERER: (Attention on knee): "Oh my knee. Oh that hurts."

SURGEON: "All right, pipe down now. (Malingerer becomes quiet.) There's nothing the matter with your stomach. I was pressing on it while you were yelling about your knee. (To Medical Corporal) Give this man two ounces of castor oil."

MALINGERER: "I don't need that. I been six times to the latrine since breakfast."

(Surgeon signals to Corporal to hold up on the oil.)

SURGEON: (to malingerer): "Was there any blood?"

MALINGERER: "No sir, just stuff."

SURGEON: (to Corporal): "Go ahead. Give him the oil. (Malingerer drinks it, make a face, is quiet.) You wait over there, I'm going to send you back to the front." (Malingerer sits down, remains quiet.)

INSTRUCTOR: "Malingerers are often held in medical installations and returned to their organizations by military police who regularly visit these stations for this purpose, or the surgeon may use his own personnel to send the man forward and thus get him out of the station.

"Up to the present we have introduced several artificial factors into this demonstration: the quiet is abnormal, a battle is going on just over that hill, enemy shells are screaming overhead, our own artillery is replying. High angle fire falls in our vicinity, shells detonate against the tree tops overhead and the safety of our defiladed position is purely relative. We have eliminated all of that so that the class may hear what is going on in the station. Also,

the wounded have arrived one at a time; in actual combat they usually appear in groups which temporarily overwhelm the medical personnel. From now on we propose to bring the cases into the station at the rate we must expect in combat."

The following cases appear from the screen noted (the first four cases, Nos. 8 to 11, should be started within a few seconds of each other; after that the next case leaves his screen as the preceding case arrives at the aid station):

Case No.		*Screen*
8 and 9	Case 8 has a wound of the left arm. He is assisting Case 9, who has a head wound.	Walking south
10	Wound, right calf The corporal reports that the ATS is almost gone. The surgeon sends a message to the collecting company, by the contact agent, requesting replacement at once.	Walking north
11	Wound, right shoulder	Walking south
12	Wound, chest	Litter north

INSTRUCTOR: "The chest case dies on the operating table. The surgeon has the litter bearers put him with the other dead man. Burial details from the division will look after them later. If this aid station has moved to another site when the burial detail arrives in this area, it will be guided to this group of dead by the helmet on the reversed rifle, used to mark the location of the first man."

Case No.		*Screen*
13	Wound, right forearm	Walking north
14	Wound, left knee	Litter north

INSTRUCTOR: "A runner is coming in from the right. He has a message from the Battalion CP requesting a report of casualties which have passed through the aid station. A tabulation is made from the Sick Blotter and sent to the battalion commander by the same messenger. Many

casualties from this battalion will find their way to other aid stations or even back to the Collecting Station without going through any aid station, but this report is accurate as far as it goes and it is the earliest information that can be obtained of the losses which the battalion has sustained.

"The litter squad which brought in the chest case is ready to return to the front. The supply sergeant reports them to the surgeon, who orders them to take the malingerer back to his company and turn him over to his first sergeant."

Case No.		*Screen*
15	Sprain, right ankle	Walking north
16	Wound, left hand	Walking north
17	Wound, abdomen	Litter north

INSTRUCTOR: "While they are at work, notice the distribution of duties when three officers are serving in an aid station. One officer, the Assistant Battalion Surgeon, is in charge of the collection of wounded into the aid station and the care of the slightly wounded. Slightly wounded are of great importance from a military standpoint because many of them can be returned to their outfits as replacements. In combat we give first priority to the care of such cases. The other two officers are attending the seriously wounded, one of them—the battalion surgeon—being also in general charge of the medical service of the entire battalion and in touch with the Battalion Command Post in order to secure early information of plans which may change the situation. The other—the Assistant Regimental Surgeon—is a dental officer. He and his enlisted assistant reported to the aid station this morning. They carry their individual dental equipment, which is sufficient to render emergency treatment for dental disabilities in combat. Notice that the dental officer dresses his full share of all types of wounds, and also that he attends all the jaw cases."

The contact agent enters from Collecting Company screen with ATS. He is followed by litter bearers with replacements of blankets, splints, etc.

INSTRUCTOR: "The contact agent is returning with the ATS from the collecting station. The litter bearers who

took the first seriously wounded to the collecting station are back. Notice that they are bringing in litters, blankets, and splints to exchange for those that were evacuated with the first patients."

Case No.		*Screen*
18	Wound, chest	Litter north
19	Face wound	Litter north
20	Wound, right hip	Litter north

INSTRUCTOR: "We will leave the battalion aid station now and go back to see what's happening in the regimental aid station."

REGIMENTAL AID STATION

The regimental aid station has been established in the draw in the north portion of the 52d Infantry Woods, 30 yards east of the First Division Road (see Figure 2). A motor ambulance, with two litter cases in it, is at the station. Three litter cases (one a Thomas leg splint) and one sitting case (a jaw injury) are in the station. A screen has been erected 75 yards south of the station.

INSTRUCTOR: "This is the regimental aid station established under orders of the regimental surgeon in the north portion of the 52d Infantry Woods. It is about 300 yards northeast of the regimental command post. It has good concealment and is protected by the defilade of Turner Hill. This station serves the regimental headquarters, any troops in the vicinity of the regimental command post, and the reserve battalion (the 3d in this problem) which was ordered assembled in these woods. It has been suggested that a better title for the regimental aid station would be the Headquarters Aid Station, as we have seen that casualties from aid stations of the assault battalions are *not* evacuated through this station. After being treated and recorded at *any* aid station, wounded are evacuated direct to the divisional collecting station. Each aid station is evacuated individually. In this demonstration all aid stations of the

1st Brigade are evacuated to the division collecting station which is on the First Division Road about 500 yards northeast of here.

"The personnel serving the regimental aid station consists of the two officers and ten enlisted men of headquarters section. The captain (or 1st lieutenant), Medical Corps, commands the section serving immediately under the regimental surgeon. The captain (or 1st lieutenant), Dental Corps, is his assistant and is also the regimental dental surgeon. The section is divided into two squads, a litter bearer squad of four men and the regimental aid station squad of two officers and six men. There are no company aid men in this section. The litter bearer and aid station squads have the same duties as those in the battalion sections. The equipment of the regimental aid station is the same as that of a battalion aid station, except that here we find a dental chest for each of the two dental officers. Over there you see a dental chest open, with dental instruments and medicines on its trays. The chair and dental engine were also packed in the chest.

"It is now 11:40 AM. The casualties now in this station came from the reserve battalion. Two litter cases have been loaded in the ambulance by the aid station squad. Ambulances are used to evacuate all aid stations which they can reach, thus economizing in time and labor. During daylight, ambulances could not reach the aid station of the 1st Battalion but they can come this far forward under cover of Turner Hill."

The headquarters section loads two more litter cases and the sitting case into the ambulance.

INSTRUCTOR: "The sergeant is delivering a message to the ambulance driver. It is addressed to the collecting station and asks for additional supplies. These supplies will be sent to this aid station in the next ambulance which comes forward."

A runner enters the aid station from across the First Division Road.

INSTRUCTOR: "The runner entering the station is a member of the headquarters section. He has been stationed

at the regimental surgeon's office. He brings a message from the regimental surgeon directing that the regimental aid station advance to the former site of the aid station, 1st Battalion."

Headquarters section packs up the station and moves by hand behind screen south of the station, carrying the aid station equipment on litters, leaving one litter case and an attendant at the station.

INSTRUCTOR: "By this time the 1st Battalion has taken Jordan Hill, and its aid station has advanced accordingly. It is often advisable for a following unit—like this regimental aid station—to use the same site for its aid station as was used by the unit which has gone ahead—in this case the 1st Battalion. Routes to that site are already marked and the wounded in the area know its location. If the 1st Battalion had any wounded awaiting evacuation when its aid station went forward, those wounded would be left at the site under the care of one or more medical attendants. When the surgeon of the regimental aid station comes up to the site, he will assume responsibility for those wounded men at once, releasing the attendants and sending them to rejoin the 1st Battalion Section.

"Following the same procedure, the commanding officer of the headquarters section has detailed one of his men to remain with the case which has not been evacuated. Headquarters section, less this attendant, has moved its station by man-power. It left behind only the cooker for heating cocoa (the tin was too hot to handle); the tent, tent fly and case of tent pins (which are used only in case of inclement weather); and the dental chest belonging to the dental officer who is on temporary duty with the 1st Battalion."

AMBULANCE SHUTTLE

INSTRUCTOR: "For the next part of the demonstration we will need a bird's-eye view of the entire divisional medical service. This map (Figure 96) shows most of the area over which the division is operating. To the south is the Red position, with Jordan Hill near its center. This is the Blue line of departure. Here (indicating) is located the aid station, 1st Battalion 1st Infantry. The 2d Battalion's aid station is in these woods and we have just seen the regimental aid station, here in the 52d Infantry Woods. There were similar aid stations of the 2d Infantry, which is the other regiment of the 1st Brigade.

"This collecting station (indicating on map) is evacuating casualties from all aid stations of the 1st Brigade. It sent a contact agent to each aid station to supervise the evacuation. Evacuation is direct from each aid station to the collecting station. Slightly wounded men walk, the seriously wounded are carried by litters and in certain situations it may be possible for an ambulance to reach an aid station.

"A similar process is going on in the 2d Brigade. From collecting stations all cases are carried by ambulance to the hospital station.

"We are ready now to let this ambulance start back with its load of patients. (Motor ambulance leaves, turns east on First Division Road, moving out of sight of the class. Patients get out and ambulance waits for signal to return.) We will follow the ambulance on the map.

"It goes first to the collecting station. This station is little more than an enlarged aid station. The driver delivers the request from the regimental aid station for supplies. A medical officer inspects the dressings and decides which cases should be sent on to the hospital. Cases that show signs of shock are kept in the collecting station until improved sufficiently to stand further evacuation. All medical installations in the field are charged with the sorting of casualties. This function is especially important at the collecting station since walking wounded frequently arrive

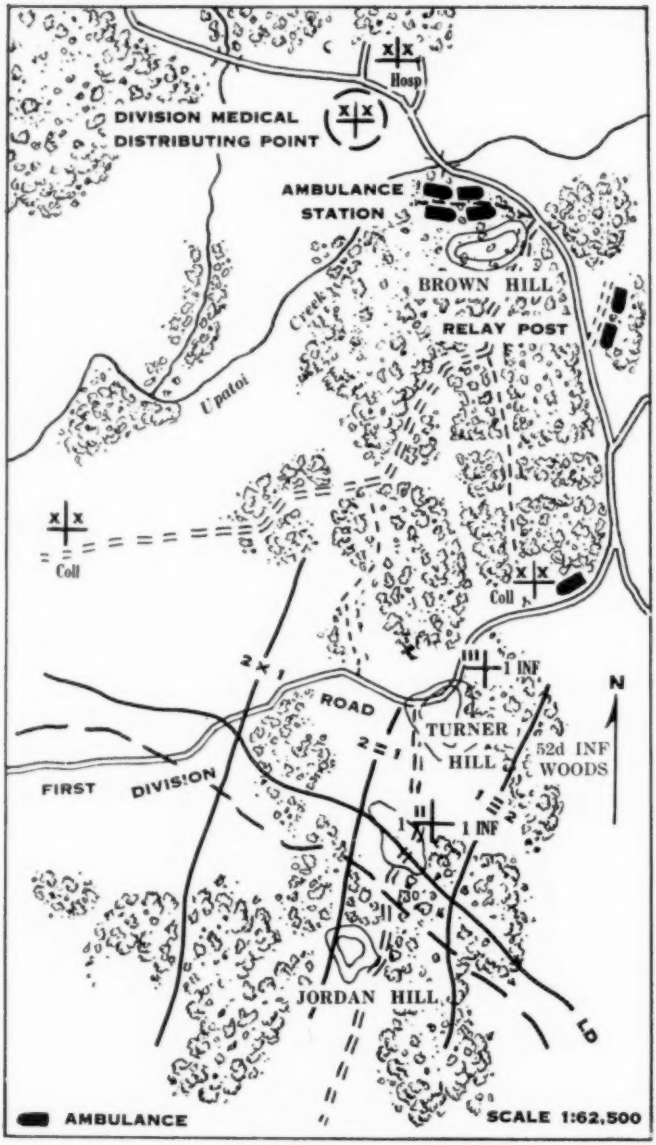


FIGURE 96.—The ambulance shuttle.

without having passed through an aid station. Some of the slightly wounded may be returned to duty, together with any stragglers and malingerers. They are turned over to the military police for return to their organizations. The station is designed for emergency treatment only of all classes of cases. No surgical operations are performed except those necessary to save life. In general, treatment consists of the application and adjustment of splints and dressings and the combatting of shock. Patients are also given hot drinks or soup.

"Normally one ambulance company serves each collecting station. In combat an ambulance company distributes its ambulances in depth, in order—

To insure the presence of empty ambulances where needed;
To minimize ambulance losses;
To secure rest for the drivers and opportunity to service the motors, even though the company should be on continuous duty; and
To avoid traffic congestion, particularly in the forward areas.

"This distribution is known as the Ambulance Shuttle.

"At the forward end of the shuttle are Ambulance Loading Posts—places where the wounded are loaded into ambulances, such as collecting stations; sometimes aid stations, as at this regimental station; and occasionally they are simply designated points along the ambulance route. Ambulances are loaded by collecting station or aid station personnel.

"The ambulance we saw at the regimental aid station is now at the collecting station (pointing) loaded with cases for the hospital station and is ready to start back through the shuttle (pointer follows route of the ambulance).

"It follows directing signs put out by the ambulance company. At this point (indicating) it will pass an Ambulance Relay Post—a selected point along the route between the collecting and hospital stations where one or several ambulances await their turn to go forward. Relay

posts should have concealment and should not be located at crossroads or near ammunition distributing points, bridges, or fords. The loaded ambulance passes the relay post and proceeds toward the hospital. The noncommissioned officer in charge of the post wakes up the driver of the ambulance which has been longest at the relay post. Ambulance drivers are expected to get their rest when they can. The empty ambulance (points) starts toward the front.

"The loaded ambulance (pointer follows route) continues to the rear and when it reaches Brown Hill it passes the Ambulance Station. This is the bivouac of the ambulance company and the site of the largest of the relay posts. The dispatcher at the ambulance station sends an empty ambulance into the shuttle, headed toward the front. It goes as far forward as the first relay post, and there waits its turn to go on.

"In the meantime our loaded ambulance (pointer follows ambulance) has crossed Upatoi Creek and reached the hospital station. Ordinarily but one hospital station is required for a division. A hospital company at a station can accommodate 250 patients on gold medal cots, litters, or bed sacks stuffed with straw. It should be on a good road. It requires a space approximately 150 by 100 yards. It must have a water supply. It should be beyond the range of the hostile artillery. The hospital station is the most elaborate of the installations of the divisional medical service. Even so, it is equipped to furnish only temporary treatment and emergency-type operations.

"The ambulance has discharged its patients at the receiving tent. Here they are bathed, clothing that has been contaminated with gas is removed, and the cases are given a more thorough examination than was possible in collecting or aid stations.

"The length of time cases are held in the hospital station depends upon the tactical situation. Patients who will require prolonged treatment are evacuated as soon as their condition permits. During quiet periods, cases expected to recover in one or two days may be held in the hospital station until restored to duty. If many casualties are arriving

or an early move of the hospital station is contemplated, evacuation must be accelerated. Casualty lists kept at the hospital station give division headquarters early and fairly complete information of the total casualties.

"A hospital company can establish its basic unit and begin functioning in one hour. Three hours are required to establish the complete hospital station.

"The ambulance (pointer follows ambulance) on leaving the hospital station stops at the Division Medical Distributing Point and picks up any supplies for the ambulance, collecting or aid stations. It then goes to the ambulance station, where supplies for the collecting station are transferred to the next ambulance that will enter the shuttle. Here the driver is fed and rested and the motor serviced.

"At the collecting station, the supplies requested by the regimental aid station are put in the empty ambulance and dispatched forward (pointer follows ambulance).

"You can see the ambulance from the shuttle approaching. (Ambulance arrives, turns around, doors are opened towards the student officers to show it is empty, except for carton of supplies.)

"The remaining wounded man is loaded into the ambulance. The ambulance leaves toward the collecting station. The attendant, carrying the carton of supplies, goes forward to the new site of the regimental aid station."

As staged at The Infantry School this demonstration required the following troops, equipment, and supplies:

Infantry:	
BLUE FORCE:	*Equipment*
Skeleton Regtl CP: S-1, S-3, Sgt Maj, 2 clerks, 4 messengers	Field uniforms, light packs, helmets, 2 tables, chairs, maps.
1 Rifle Platoon	Full field, less rolls, helmets, 500 rounds cal. .30 BLANK ammunition
1 MG Section (simulates fire of light MGs)	2 MGs cal. .30 1,000 rounds cal. .30 BLANK ammunition
RED FORCE:	
1 MG Section	1 pr field glasses, 2 MGs cal. .30, fatigue uniform 1,000 rounds cal. .30 BLANK ammunition
Medical Department: (skeleton regtl med det)	Field uniforms, individual equipment
Hq (Regtl Surg's Office)	1 Chest MD No. 4
Hq Section plus: 1 man, signalman (Note: members of Regtl Surg's Office can double in Regtl Aid Station by changing insignia) 1 ambulance driver and orderly	Item 97646 Med Dept Supply Catalogue, incl: 1 Chest MD No. 1 1 Chest MD No. 2 plus: 1 Chest, dental dispensary 1 truck 1½-ton, 4 x 4 1 ambulance motor
1st Battalion Section (less 6 company aid men)	Item 97507 Med Dept Supply Catalogue, incl: 2 Chests MD No. 1 1 Chest MD No. 2 plus: 1 truck 1½-ton, 4 x 4

Collecting Co incl only:
1 NCO in charge of patients
1 Contact Agent
8 Litter Bearers

Engineers:
1 Officer
3 Enl Men

(Handle simulated Red artillery fire)
12 blocks, ½-pound, TNT
12 caps, tetryl, electric, issue (electric detonators)

CHAPTER 10

The 1939 Infantry

(AN INFANTRY SCHOOL STUDY)

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*"Our new infantry organization theoretically brings us abreast of modern developments and requirements. . . . it is fortunate that we have at last emerged from the period of test."**

—Major General George A. Lynch.

The following pages break down the War Department Tables of Organization for an Infantry Brigade and its component parts. These pages present details of organization and equipment not usually found in the tables.

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*Quoted from the article, *The Tactics of the New Infantry Regiment*, by Major General George A. Lynch, Chief of Infantry, March-April, 1939, issue of The Infantry Journal, p. 113.

The infantry brigade consists of a Brigade Headquarters and Headquarters Company and two Infantry Regiments.

STRENGTH

	Officers		Warrant Officers		Enlisted Men	
	P	W	P	W	P	W
Headquarters and Headquarters Company, Infantry Brigade	5	6	.....	.....	45	67
Infantry Regiment	78	115	1	1	1,768	2,426
Infantry Regiment	78	115	1	1	1,768	2,426
Total	161	236	2	2	3,581	4,919

WEAPONS

	Peace	War
Rifle, U.S. cal. .30 M1 (a)	1,969	3,045
Pistol	1,545	1,824
Gun, machine, Browning, cal. .30, M1917 (b)	96	96
Gun, machine, Browning, cal. .50, M2, flexible	12	12
Gun, machine, light (c)	72	72
Gun, 37-mm antitank	12	12
Mortar, 81-mm	12	12
Mortar, 60-mm (d)	54	54

NOTES

(a) Substitute: Rifle, U.S. cal. .30 M1903.
(b) 48 of these machine guns are for defense only.
(c) Substitute: Rifle, automatic, Browning, cal. .30, modified.
(d) 18 of these mortars are for defense only.

ORGANIZATION

BRIGADE HEADQUARTERS AND HEADQUARTERS COMPANY

	Officers		Enlisted Men		Motors	
	P	W	P	W	P	W
The Brigade Headquarters and Headquarters Company	5	6	45	67	9	9
Brigade Headquarters	(5)	(6)				
Headquarters Company			(45)	(67)	(9)	(9)
The Headquarters Company	a	a	45	67	9	9
Company Headquarters			(9)	(15)	(3)b	(3)b
Intelligence Platoon			(0)	(5)		
Staff Section			(7)	(12)	(2)c	(2)c
Communication Platoon			(29)	(35)	(4)	(4)
The Communication Platoon			29	35	4	4
Platoon Headquarters			(4)	(5)	(2)d	(2)d
Message Center Section			(7)	(10)	(2)e	(2)e
Wire Section			(9)	(10)		
Radio and Visual Section			(9)	(10)		

NOTES

a. Headquarters Company commanded by a brigade staff officer.
b. 3 trucks, 1½-ton, 4 x 4, cargo.
c. 2 cars, light, 5-passenger.
d. 2 trucks, 1½-ton, 4 x 4.
e. 2 motorcycles with sidecars.

WEAPONS

	Peace	War
Rifles, U.S., cal. .30 M1	19	39
Pistol	31	34

GRADES

THE INFANTRY REGIMENT, RIFLE (MOTORIZED)

COMMISSIONED	*Peace*	*War*
COLONELS	1	1
LIEUTENANT COLONELS	4	4
MAJORS	2	2
MAJORS OR CAPTAINS	1	4
CAPTAINS	17	18
CAPTAINS OR FIRST LIEUTENANTS	8	11
FIRST LIEUTENANTS	6	17
FIRST OR SECOND LIEUTENANTS	39	58
TOTAL	78	115
WARRANT OFFICERS	1	1
NONCOMMISSIONED		
MASTER SERGEANTS	5	5
FIRST SERGEANTS	14	14
TECHNICAL SERGEANTS	10	11
STAFF SERGEANTS	23	25
SERGEANTS	151	248
CORPORALS	216	239
PRIVATES, FIRST CLASS	467	647
PRIVATES	882	1,237
SPECIALIST, 2d	(1)	(1)
SPECIALIST, 3d	(15)	(20)
SPECIALIST, 4th	(62)	(77)
SPECIALIST, 5th	(38)	(74)
SPECIALIST, 6th	(218)	(273)
TOTAL	1,768	2,426

ORGANIZATION

THE INFANTRY REGIMENT, RIFLE (MOTORIZED)

REGIMENTAL HEADQUARTERS AND BAND

HEADQUARTERS COMPANY

SERVICE COMPANY

1ST BATTALION

- HEADQUARTERS DETACHMENT
- COMPANY A (RIFLE)
- COMPANY B (RIFLE)
- COMPANY C (RIFLE)
- COMPANY D (HEAVY WEAPONS)

2D BATTALION

- HEADQUARTERS DETACHMENT
- COMPANY E (RIFLE)
- COMPANY F (RIFLE)
- COMPANY G (RIFLE)
- COMPANY H (HEAVY WEAPONS)

3D BATTALION

- HEADQUARTERS DETACHMENT
- COMPANY I (RIFLE)
- COMPANY K (RIFLE)
- COMPANY L (RIFLE)
- COMPANY M (HEAVY WEAPONS)

ATTACHED MEDICAL

ATTACHED CHAPLAINS

IMPORTANT CHANGES

1. All riflemen are equipped with the semiautomatic rifle officially known as the U. S. Rifle, caliber .30, M1.

2. The rifle company consists of three rifle platoons and a headquarters platoon.

3. The rifle platoon consists of a platoon headquarters and three rifle squads. The squads have eight men in peace and twelve men in war.

4. The rifle section has been eliminated.

5. The headquarters platoon of the rifle company comprises a headquarters section, one 60-mm mortar section and one light machine-gun section.

6. The machine-gun company becomes the heavy weapons company. It comprises two caliber .30 machine-gun platoons, one caliber .50 machine-gun platoon and one 81-mm mortar platoon.

7. Until the light machine gun is available the rifle, automatic, Browning, M1917, modified, will be substituted.

8. The regimental headquarters company has an antitank platoon of three squads, each armed with two 37-mm antitank guns.

9. There are no animals or animal-drawn transportation.

CHARACTERISTICS OF WEAPONS

1. *60-mm Mortar.*

Maximum rate of fire	30 rounds per minute
Sustained rate of fire	18 to 20 rounds per minute
Maximum range	approximately 1,800 yards
Maximum effective range	within maxmium range, depending upon observation
Effective radius of burst	approximately 15 yards

2. *Gun, 37-mm, antitank, M3.*

Caliber	37-mm
Breech operation	manual ejection and closing
Muzzle velocity f/s	2,600
Maximum elevation on carriage	from plus 15° to minus 10°
Maximum traverse	60°
Weight in firing position	950 pounds
Armor pentration (20° from normal impact)	1½ inches at 1,000 yards
Trail	Split
Tires	Pneumatic
Rate of fire	30 rounds per minute

The gun is fired from axle jacks.

3. *U. S. Rifle, caliber .30, M1.*

It is a self-loading, gas-operated, clip-fed, air-cooled, shoulder weapon. The rifle is 43 inches in length, weighs 9 pounds, and has a pistol-grip stock. Provision has been made for attaching a bayonet, which weighs one pound.

4. *81-mm Mortar.*

The mortar is a smooth-bore, muzzle-loading, high-angle-fire weapon. It consists of three units, the mortar, the bipod, and the base plate. Each unit forms a separate load which is light enough to be carried by one man.

Length of mortar, over all	49.8 inches
Weight of mortar	43 pounds
Weight of bipod	46 pounds
Weight of base plate	45 pounds
Total weight of mortar	134 pounds
Range of light shell (approximate)	100 yards to 3,280 yards
Range of heavy shell (approximate)	100 yards to 1,280 yards
Rate of fire, maximum	30 to 35 rounds per minute
Rate of sustained fire	18 rounds per minute

MAIN DATA

THE INFANTRY REGIMENT, RIFLE (MOTORIZED)

	Peace	*War*
COMPANIES	14	14
OFFICERS	78	115
WARRANT OFFICERS	1	1
ENLISTED MEN	1,768*	2,426
AGGREGATE	1,847*	2,542
MOTORS	110	132
MOTORCYCLES	22	24

WEAPONS

Rifle, U. S., cal. .30, M1 (a)	975	1,503
Pistol	757	895
Gun, machine, Browning, cal. .30, M1917 (b)	48	48
Gun, machine, Browning, cal. .50, M2, flexible	6	6
Gun, machine, light (c)	36	36
Gun, 37-mm, antitank	6	6
Mortar, 81-mm	6	6
Mortar, 60-mm (d)	27	27

NOTES

(a) Substitute: Rifle, U. S., cal. .30, M1903. In rifle companies equipped with rifle, U. S., cal. .30, M1903, substitute one rifle, automatic, Browning, cal. .30, modified and one pistol per squad in lieu of one rifle.

(b) 24 of these guns are for defense only.

(c) Substitute: Rifle, automatic, Browning, cal. .30, modified.

(d) 9 of these mortars are for defense only.

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*Fifteen men in the ammunition section of the battalion headquarters detachment included in the totals are authorized only when the organization takes the field at peace strength in time of war.

NOTES ON AMMUNITION

(1) 17.6 rounds of caliber .30, M2 weigh one pound.

(2) 16.8 rounds of caliber .30, M1, MG weigh one pound. This ammunition is packed in belts holding 250 rounds. 1,250 rounds are carried in each ammunition box. The weight of the ammunition and container is 101 pounds.

(3) One round of caliber .50 MG ammunition weighs 0.27 pounds. It is packed in paper cartons containing 280 rounds per box. The weight of the container and the ammunition is 102 pounds.

(4) One round for the 60-mm mortar weighs 3.48 pounds.

(5) For the 81-mm mortar:

(a) The light shell weighs 7.2 pounds. Each round is packed in a fiber container which, including the round, weighs 9 pounds. Six rounds are clamped in a metal carrying frame.

(b) The heavy shell weighs 14.58 pounds. Each round is packed in a fiber container which, including the round, weighs 17.38 pounds. Three rounds are clamped together in a metal carrying frame.

AMMUNITION PER WEAPON

Weapon	Individual	Company Train	Combat Train	Service Train	Total
U.S. Rifle, M1	40 (a)	.....	(b) 192(c)	96(b)	328(a)
Auto Rifle	240 (d)	.....	900(e)	600	1,740(a)
MG, cal. .30	.....	6,750	.....	1,500	8,250(f)
MG, cal. .50	.....	3,200	.....	1,600	4,800(g)
Mortar, 81-mm	.....	138	.....	162	300(h)
Mortar, 60-mm	.....	350	.....	100	450
Pistol, cal. .45	21	.....	7	.....	28
37-mm. Gun, M3	.....	300	.....	100	400

(a) 12 percent armor-piercing, 81 per cent ball, and 7 per cent tracer.

(b) Per rifle in rifle platoon.

(c) One or two bandoleers are issued to each rifleman prior to combat.

(d) 80 rounds are carried by the light machine gunner, 80 rounds by the assistant light machine gunner, and 80 rounds by the ammunition carrier, all in magazines.

(e) 300 rounds to be issued prior to combat; 100 to the light machine gunner, 100 to the assistant light machine gunner, and 100 to the ammunition carrier, all in magazines. 600 rounds are retained in the combat train as a reserve.

(f) 6 per cent armor-piercing, 81 per cent ball, and 13 percent tracer.

(g) 80 per cent armor-piercing, and 20 per cent tracer.

(h) 80 per cent M-43 (light), and 20 per cent M-45 (heavy).

TROOP MOVEMENT BY MOTOR TRANSPORTATION

The following table will be used to determine the number of trucks, in addition to organic transportation, required to move that part of the infantry regiment, rifle (war strength), indicated in the table.

UNIT	Number of dismounted officers and men	Movements not in excess of 50 miles		Movements in excess of 50 miles	
		1½-ton trucks	2½-ton trucks	1½-ton trucks	2½-ton trucks
Headquarters Platoon, Rifle Company	39	3	2	3	2
Rifle Platoon, Rifle Company	40	3	2	4	2
Infantry Company, Rifle	159	11	7	13	8
Headquarters and Headquarters Detachment, Battalion, Rifle	37	3	2	3	2
Infantry Battalion, Rifle	514	35	21	40	26
Headquarters and Headquarters Company Regiment, Rifle	88	6	4	7	5
Infantry Company, Service, Regiment, Rifle	36	3	2	3	2
Medical Detachment Infantry, Regiment, Rifle	40	3	2	3	2
Infantry Regiment, Rifle	1706	114	69	132	86

NOTE: The above table is based upon the use of 1½-ton trucks as weapons and ammunition carriers for all regimental units except the antitank platoon of the regimental headquarters company, and upon the information in regard to the normal loads of all vehicles available at this time, (26 April 1939).

For the short hauls of under fifty miles the 1½-ton truck can carry 15 men per truck and the 2½-ton truck can carry 25 men per truck. For the long hauls the 1½-ton truck can carry 13 men per truck and the 2½-ton truck can carry 20 men per truck.

No 2½-ton trucks are necessarily required to move the 1939 infantry regiment, rifle, since there are no animals and the kitchens have been replaced by kitchen trucks.

SUMMARY OF ORGANIC TRANSPORTATION

	Peace	*War*
Cars, light, 5-passenger, phaeton		
Headquarters Company		
Company Headquarters	4	5
Antitank Platoon	1	1
Communication Platoon	1	1
Service Company		
Company Headquarters	1	1
Platoon Headquarters (Transportation Platoon)	1	1
Infantry Battalion		
Battalion Headquarters Detachment (1 for each battalion)	3	3
Heavy Weapons Company (5 for each battalion)	15	15
Regimental Medical Detachment	1	1
Total	27	28
Motorcycles, with sidecar		
Headquarters Company		
Communication Platoon	4	4
Service Company		
Company Headquarters	1	1
Supply Section	1	1
Platoon Headquarters (Transportation Platoon)	0	1
3 Battalion Sections	3	3
Maintenance Section	1	1
Infantry Battalion		
Battalion Headquarters Detachment (2 for each battalion)	6	6
Heavy Weapons Company (2 for each company)	6	6
Regimental Medical Detachment	0	1
Total	22	24

	Peace	*War*
Trucks, ½-ton, 4 x 4, for 37-mm guns		
Headquarters Company (Antitank Platoon)	6	9
Trucks, 1½-ton, 4 x 4, weapon and ammunition carrier		
Infantry Battalion		
Rifle Company	9	9
(1 for each company)		
Heavy Weapons Company	21	36
(7 peace and 12 war for each company)		
Trucks, 1½-ton, 4 x 4, communication		
Headquarters Company	5	5
Trucks, 1½-ton, 4 x 2, kitchen		
Service Company	14	0
Trucks, 1½-ton, 4 x 4, kitchen		
Service Company	0	14
Trucks, 1½-ton, 4 x 4, 9 combat and 1 maintenance		
Service Company	10	10
Trucks, 1½-ton, 4 x 4, medical		
Regimental Medical Detachment	4	4
Trucks, ½-ton, pickup		
Service Company	0	3
Trailers, ¾-ton, 2-wheel		
Service Company	14	14
Total (all classes)	132	156

FEEDING THE TROOPS

The ration and kitchen truck is a standard, 1½-ton truck and tows a ¾-ton, 2-wheel trailer. It carries the mess crew, one field range No. 1, one and one-third ration, water cans, and marmite cans for serving hot food.

Rolling kitchens have been eliminated. The kitchen sections have been taken out of the combat trains and placed in the regimental field trains.

Time required to perform usual kitchen work is shown below:

Work	*Daylight*	*Dark*
Kitchens to be taken off trucks, set up and ready to begin cooking	30 minutes	40 minutes
Kitchens to cook and prepare for serving a hot meal, starting with a hot kitchen	1 hour	1½ hours
Serving a hot meal to troops from a kitchen truck when majority of men are served at the truck	20 minutes	35 minutes
Serving a hot meal to troops by means of carrying parties (assuming the kitchen truck not farther than 1,000 yards in rear of the company and the company deployed on a front not greater than 1,000 yards)	1 hour	1½ hours

OTHER INTERESTING DEVELOPMENTS

1. The infantry battalions have headquarters detachments instead of headquarters companies. They consist of—

Headquarters Section
Message Center Section
Intelligence Section
Ammunition Section (inactive in peace-strength organization).

2. The following shows the intelligence personnel within the regiment.

The Regimental Intelligence Officer	*Peace*	*War*
Captain, S-2	*1	1

*In peace one officer combines the duties of S-2 and S-3.

The Intelligence Platoon (Regimental Headquarters Company)		
Staff Sergeant, section leader	1	1
Sergeant, topographical, draftsman	1	1
Corporal, scout, observer	0	2
Privates, scouts, observers	0	6

The Battalion Intelligence Officer		
1st Lieutenant	1	1

(Combines the duties of adjutant, intelligence officer, and detachment commander)

The Battalion Intelligence Section (Battalion Headquarters Detachment)		
Staff Sergeant, topographical draftsman	1	1
Corporal, intelligence	1	1
Privates, intelligence	0	6

3. *a.* Communications are centered in the regiment. In the communication platoon, regimental headquarters company, there are found—

Platoon Headquarters
Regimental Section
Message Center Section
Wire Section
Radio and Visual Section
(includes panel section)
Three battalion sections, each containing wire, radio and visual personnel.

b. Training and employment of the communication platoon:

(1) *Training.*—The technical training of the communication platoon should be conducted by the regimental communication officer. The battalion message center sections, an organic part of each battalion headquarters detachment, should also be trained by the Regimental Communication Officer with their respective battalion sections. Each battalion section of the regimental communication platoon should have a specific designation, as, first, second or third battalion section, and the battalion sections should invariably function with their respective battalions for tactical operations.

(2) *Employment on the march.*—On the march the regimental section of the communication platoon, less motor transportation, should march at the head of the main body and each battalion section marches with its battalion in a similar manner.

When the entire regiment is a part of the main body of the motor vehicles of the communication platoon, except those needed for command purposes, will march with the vehicles of the main body.

When part of the regiment is on an advance guard mission, the communication motor vehicles of the advance guard, except those needed for command purposes, will march with the advance guard motor vehicles, which move by bounds immediately in rear of the main body.

(3) *Employment of battalion sections in general.*—Battalion sections are directly under the command of the battalion commander as in the case of any other unit of the battalion. However, the regimental commander may direct that certain wire lines (for which regiment is ordinarily responsible) be installed by battalions in order to expedite the installation. The communication section of a reserve battalion may be used to install wire lines as directed by the regimental commander, but should be readily available to the battalion when needed. Battalions will extend their wire lines as they move forward in the attack.

(4) *Use of the four battalion and eight regimental telephones.*—The new organization does not affect our present teaching concerning the employment of telephones. In the defense or a slow moving situation the battalion may use two local telephones (one commanding officer and staff, and one OP). In some circumstances telephone lines may be installed to companies in the defense. For this purpose telephones are borrowed from the regiment.

When the advance is rapid the battalion may not install a switchboard but simply have a single telephone connected to the end of the line installed from regiment, or if necessary the line may be a party line with one telephone at the battalion CP and one at the battalion OP. The regiment in a like situation would install a switchboard but not so many local telephones as would be the case when the advance is slow, or when in a defensive situation.

(5) *Use of the voice radio set SCR-195.*—There are 27 non-interfering, voice-radio, channels available for infantry use. The number of channels available for each regiment depends upon the frontage occupied. It is thought that there will always be at least four channels available for each infantry regiment.

ORGANIZATION

HEADQUARTERS AND HEADQUARTERS COMPANY, INFANTRY REGIMENT

	Officers		Enlisted Men		Motors	
	P	W	P	W	P	W
The Headquarters Company	7a	13a	128	176	21	25
Regimental Headquarters	(4)	(5)				
Company Headquarters	(1)	(2)	(16)	(18)	(4)b	(5)b
Antitank Platoon	(1)	(2)	(40)	(53)	(7)	(10)
Intelligence Platoon			(2)	(10)		
Communication Platoon	(1)	(4)	(70)	(95)	(10)	(10)
The Antitank Platoon	1	2	40	53	7	10
Platoon Headquarters	(1)	(2)	(4)	(8)	(1)c	(4)c
Three Antitank Sections			(36)	(45)	(6)	(6)
The Antitank Section			12	15	2	2
Section Headquarters			(2)	(3)		
Two Antitank Squads			(10)	(12)	(2)d	(2)d
The Communication Platoon	1	4	70	95	10	10
Platoon Headquarters	(1)	(1)	(2)	(2)	(1)e	(1)e
Regimental Section			(32)	(45)	(3)	(3)
Three Battalion Sections		(3)	(36)	(48)	(6)	(6)
Regimental Section			32	45	3	3
Message Center Section			(6)	(7)	(1)f	(1)f
Wire Section			(13)	(20)	(1)g	(1)g
Radio and Visual Section			(13)	(18)	(1)h	(1)h
Battalion Section		1	12	16	2 i	2 i

NOTES

a. S-4 carried in tables of Service Company.
b. 4 cars, light, 5-passenger, 1 additional for war strength.
c. 1 car, light, 5-passenger; 3 trucks, ½-ton, 4 x 4, weapons and ammunition carrier for war strength.
d. 1 truck, ½-ton, 4 x 4, weapon and ammunition carrier for each squad.
e. 1 car, light, 5-passenger.
f. 1 motorcycle with side car.
g. 1 truck, 1½-ton, 4 x 4, communication.
h. 1 truck, 1½-ton, 4 x 4, communication.
i. 1 motorcycle with sidecar and 1 truck, 1½-ton, 4 x 4, communication.

WEAPONS

	Peace	War
Rifle, U.S., cal. .30 M1	37	54
Pistol	98	135
Gun, 37-mm, antitank	6	6

ORGANIZATION

SERVICE COMPANY

	Officers		Enlisted Men		Motors	
	P	W	P	W	P	W
The Service Company	5	9	69	110	46	50
Company Headquarters	(2)a	(2)a	(11)	(16)	(4)f	(4)f
Regimental Headquarters Platoon	(1)	(2)	(18)	(35)	(1)	(1)
Transportation Platoon	(2)	(5)	(40)	(59)	(41)	(45)
The Regimental Headquarters Platoon	1	1	18	35	1	1
Staff Section	(1)b	(1)b	(11)	(18)		
Supply Section		(1)c	(7)	(17)	(1)g	(1)g
The Transportation Platoon	2	5	40	59	41	45
Platoon Headquarters	(1)	(1)	(3)	(5)	(1)h	(2)h
Three Battalion Sections		(3)d	(27)	(39)	(36)i	(36)i
Headquarters Company Section			(1)	(2)	(2)j	(2)j
Maintenance Section	(1)e	(1)e	(9)	(13)	(2)k	(5)k

NOTES

a. One major:regimental supply officer (S-4); commands regimental supply service; one captain: commands service company.
b. Personnel adjutant.
c. Munitions officer.
d. Battalion supply officer (S-4); commands battalion section.
e. Maintenance officer.
f. 1 car, light, 5-passenger; 1 motorcycle with sidecar; 1 trailer, ¾-ton, 2-wheel; 1 truck, 1½-ton, 4 x 4 (kitchen).
g. 1 motorcycle with sidecar.
h. 1 car, light, 5-passenger; 1 motorcycle with sidecar added for war strength.
i. FOR EACH BATTALION SECTION: 1 motorcycle with sidecar; 4 trailers, ¾-ton, 2-wheel; 7 trucks, 1½-ton, (3 combat, 4 kitchen).
j. 1 trailer, ¾-ton, 2-wheel; 1 truck, 1½-ton, (kitchen).
k. 1 motorcycle with sidecar; 1 truck, 1½-ton, motor maintenance; 3 trucks, ½-ton, pick-up added for war strength.

WEAPONS

	Peace	War
Rifle, U.S., cal. .30 M1	50	87
Pistol	24	32

MAIN DATA

THE RIFLE BATTALION

	Peace	*War*
COMPANIES	4	4
OFFICERS	19	27
ENLISTED MEN	*491	672

WEAPONS

Rifle, U.S., caliber .30, M1 (a)	296	454
Pistol	202	235
Gun, machine, Browning, caliber .30, M1917 (b)	16	16
Gun, machine, Browning, caliber .50, M2, flexible	2	2
Gun, machine, light (c)	12	12
Mortar, 81-mm	2	2
Mortar, 60-mm (d)	9	9

NOTES

*Fifteen men in the ammunition section of the battalion headquarters detachment included in the totals are authorized only when the organization takes the field at peace strength in time of war.

(a) Substitute: Rifle, U. S., caliber .30, M1903. In rifle companies equipped with rifle, U. S., caliber .30, M1903, substitute one rifle, automatic, Browning, caliber .30, modified and one pistol per squad in lieu of one rifle.

(b) Eight of these guns are for defense only.

(c) Substitute: Rifle, automatic, Browning, caliber .30, modified.

(d) Three of these mortars are for defense only.

TRANSPORTATION

Cars, light, 5-passenger, phaeton		
Battalion Headquarters Detachment	1	1
Heavy Weapons Company	5	5
Motorcycles with sidecar		
Battalion Headquarters Detachment	2	2
Heavy Weapons Company	2	2
Trucks, 1½-ton, 4 x 4, weapon and ammunition carrier		
Rifle Company (one for each)	3	3
Heavy Weapons Company	7	12

ORGANIZATION

THE RIFLE COMPANY

	Officers		Enlisted Men	
	P	W	P	W
The Rifle Company	4	6	114	162
Headquarters Platoon	(1)	(3)	(33)	(45)
Three Rifle Platoons	(3)	(3)	(81)	(117)
The Headquarters Platoon	1	3	33	45
Company Headquarters	(1)	(3)	(10)	(16)
60-mm Mortar Section				
Section Headquarters			(2)	(3)
2 Mortar Squads			(10)	(10)
Light Machine-Gun Section				
Section Headquarters			(1)	(2)
2 Light Machine-Gun Squads			(10)	(14)
The Rifle Platoon	1	1	27	39
Platoon Headquarters	(1)	(1)	(3)	(3)
3 Rifle Squads			(24)	(36)

WEAPONS

	Peace	War
Rifle, U.S., caliber .30, M1 (a)	89	132
Pistol	25	32
Gun, machine, light (b)	4	4
Mortar, 60-mm (c)	3	3

NOTES

(a) Substitute: Rifle, U.S., caliber .30, M1903. In rifle companies equipped with Rifle, U.S., caliber .30, M1903, substitute one rifle, automatic, Browning, caliber .30, modified and one pistol per squad in lieu of one rifle.

(b) Substitute: Rifle, automatic, Browning, caliber .30, modified.

(c) One of these mortars is for defense only.

TRANSPORTATION

1 Truck, 1½-ton, 4 x 4, weapon and ammunition carrier.

ORGANIZATION

THE HEAVY WEAPONS COMPANY

	Officers		Enlisted Men	
	P	W	P	W
The Heavy Weapons Company	5	6	123	143
Company Headquarters	(1)	(2)	(16)	(21)
2 Caliber .30 Machine-Gun Platoons	(2)	(2)	(72)	(82)
1 Caliber .50 Machine-Gun Platoon	(1)	(1)	(18)	(20)
1 81-mm Mortar Platoon	(1)	(1)	(17)	(20)
The Caliber .30 Machine-Gun Platoon	1	1	36	41
Platoon Headquarters	(1)	(1)	(4)	(7)
2 Machine-Gun Sections			(32)	(34)
The Caliber .30 Machine-Gun Section			16	17
Section Headquarters			(2)	(1)
2 Machine-Gun Squads			(14)	(16)
The Caliber .50 Machine-Gun Platoon	1	1	18	20
Platoon Headquarters	(1)	(1)	(2)	(4)
2 Machine-Gun Squads			(16)	(16)
The 81-mm Mortar Platoon	1	1	17	20
Platoon Headquarters	(1)	(1)	(3)	(4)
2 Mortar Squads			(14)	(16)

WEAPONS

	Peace	War
Rifle, U.S., caliber .30 M1 (a)	22	38
Pistol	106	111
Gun, machine, Browning, caliber .30, M1917 (b)	16	16
Gun, machine, Browning, caliber .50, M2, flexible	2	2
Mortar, 81-mm	2	2

NOTES

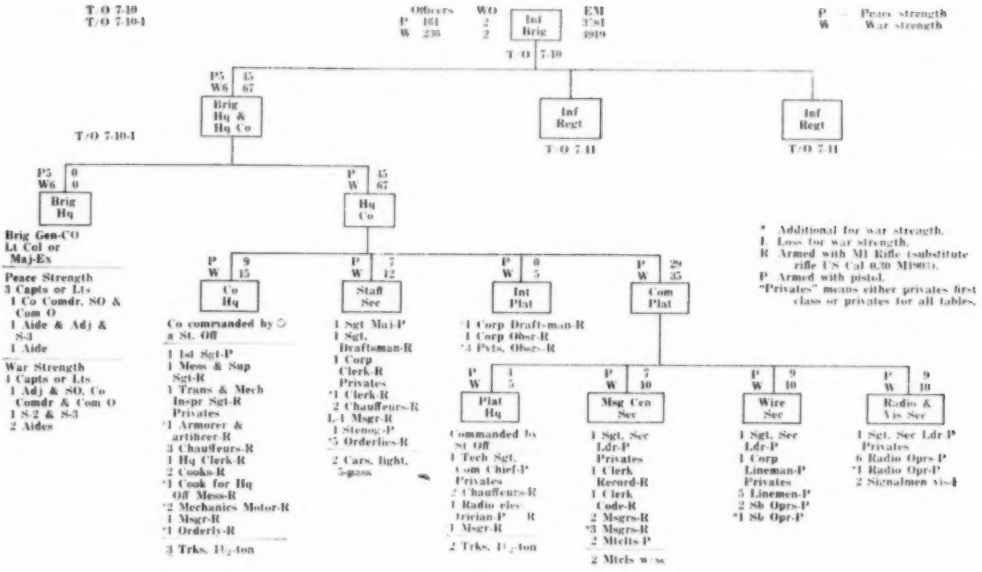
(a) Substitute: Rifle, U.S., caliber .30, M1903.
(b) Eight of these guns are for defense only.

TRANSPORTATON

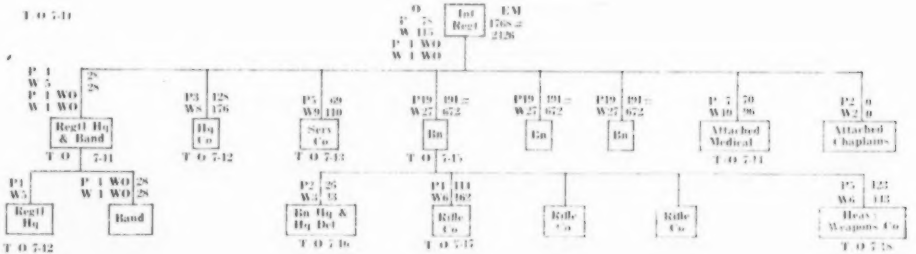
	Peace	War
Cars, light, 5-passenger	5	5
Trucks, 1½-ton, 4 x 4, weapon and ammunition carrier	7	12
Motorcycle with sidecar	2	2

The following tables show in detail the organization of the 1939 regiment to include personnel, weapons, and motor transportation.

INFANTRY BRIGADE



INFANTRY REGIMENT



1 Col
1 Lt Col-Ex
1 Maj or Capt, S-2 & S-3, in war acts as S-3 only
1 Capt-Adj, S-1
*1 Capt-S-2
Regtl S-4 carried in Service Co Table.

WEAPONS	*Peace*	*War*
Gun, Machine, Browning, Cal 0.30, M1917	18	18
Gun, Machine, Browning, Cal 0.50, M2, flexible	6	6
Gun, Machine, light (*a*)	36	36
Gun, 37-mm, antitank	6	6
Mortar, 81-mm	6	6
Mortar, 60-mm	27	27
Pistols	757	895
Rifle, US, Cal 0.30, M1(*b*)	975	1503

* Additional for war strength

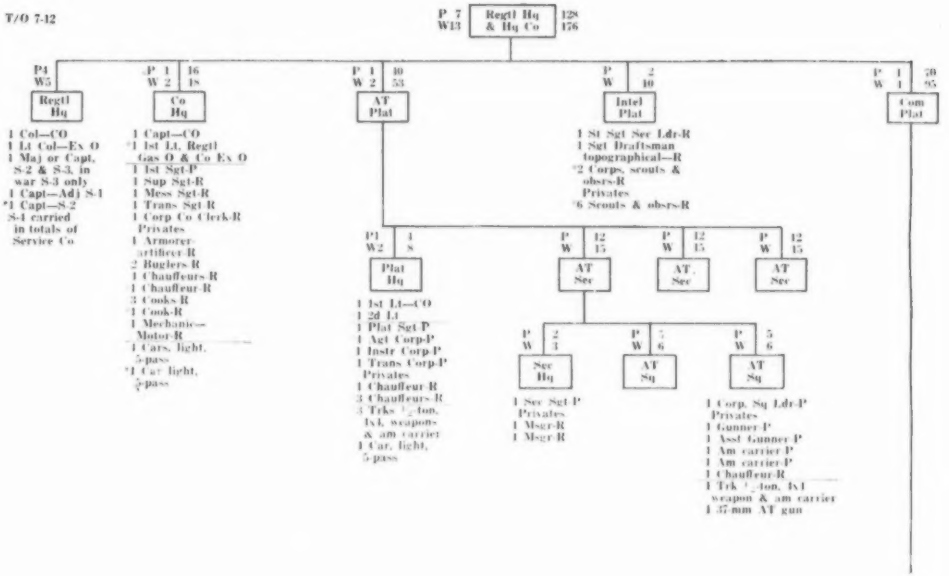
15 men in the Am Sec of the Bn Hq Det (total 45 for Regt) included in the peace totals are authorized only when the organization takes the field at peace strength in time of war.

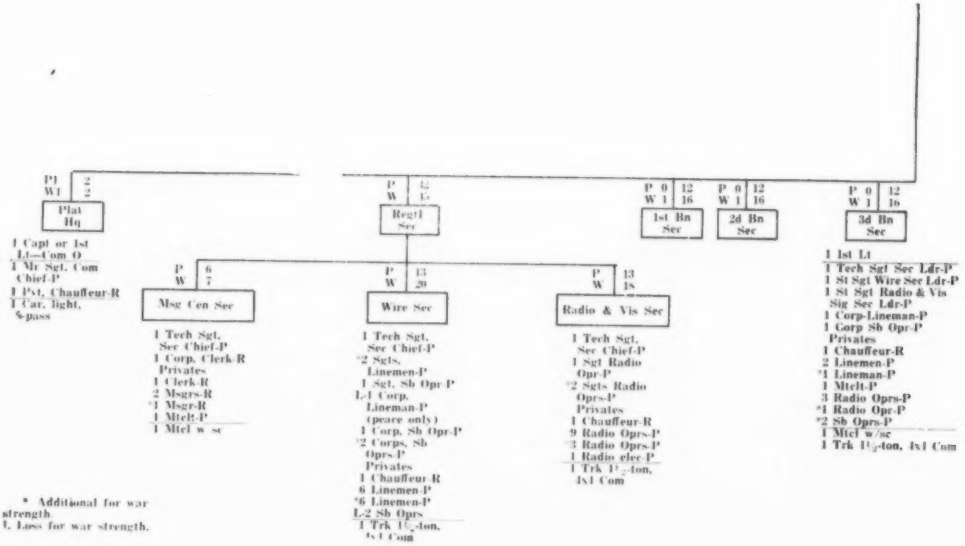
(*a*) Substitute: Rifle, automatic, Browning, Cal 0.30, modified.

(*b*) Substitute: Rifle, US, Cal 0.30, M1903. (In rifle companies equipped with rifle, US, Cal 0.30, M1903, substitute in the rifle squad, one rifle, automatic, Browning, Cal 0.30, modified and one pistol; for the remainder of the squad, rifle, US, Cal 0.30, M1903.)

HEADQUARTERS AND HEADQUARTERS COMPANY, INFANTRY REGIMENT

T/O 7-12



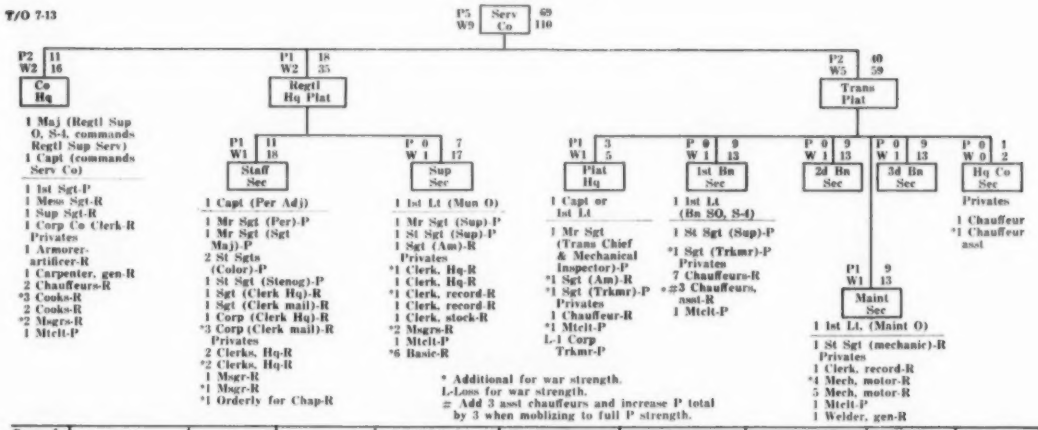


* Additional for war strength.
L Loss for war strength.

T/O 7-13

SERVICE COMPANY

T/O 7-13

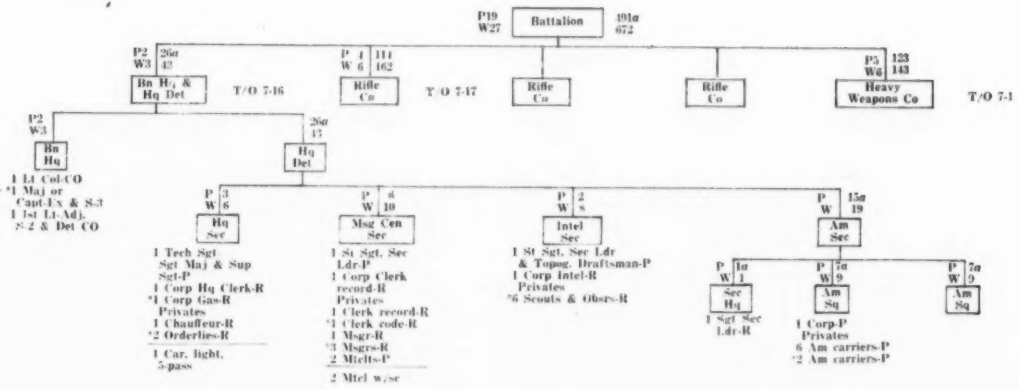


* Additional for war strength.
L-Loss for war strength.
Add 3 asst chauffeurs and increase P total by 3 when moblizing to full P strength.

Type of train	Co Hq	Staff Sec	Sup Sec	Plat Hq Trans Plat	1st Bn Sec	2d Bn Sec	3d Bn Sec	Hq Co Sec	Maint Sec
Combat					3 Trks 1½-ton	3 Trks 1½-ton	3 Trks 1½-ton		
Field	1 Car, light, 5-pass 1 Mtcl w/sc 1 Trailer, ½-ton, 2-wheel 1 Trk, 1½-ton Ki		1 Mtcl w/sc	1 Car, light, 5-pass *1 Mtcl w/sc	1 Mtcl w/sc 4 Trailers, ¾-ton, 2-wheel 4 Trks 1½-ton, Ki	1 Mtcl w/sc 4 Trailers, ¾-ton, 2-wheel 4 Trks 1½-ton, Ki	1 Mtcl w/sc 4 Trailers, ¾-ton, 2-wheel 4 Trks 1½-ton, Ki	1 Trailer, ¾-ton, 2-wheel 1 Trk 1½-ton, Ki	1 Mtcl w/sc 1 Trk 1½-ton (motor) *3 Trks ¼-ton, pick-up

INFANTRY BATTALION

T/O 7-15

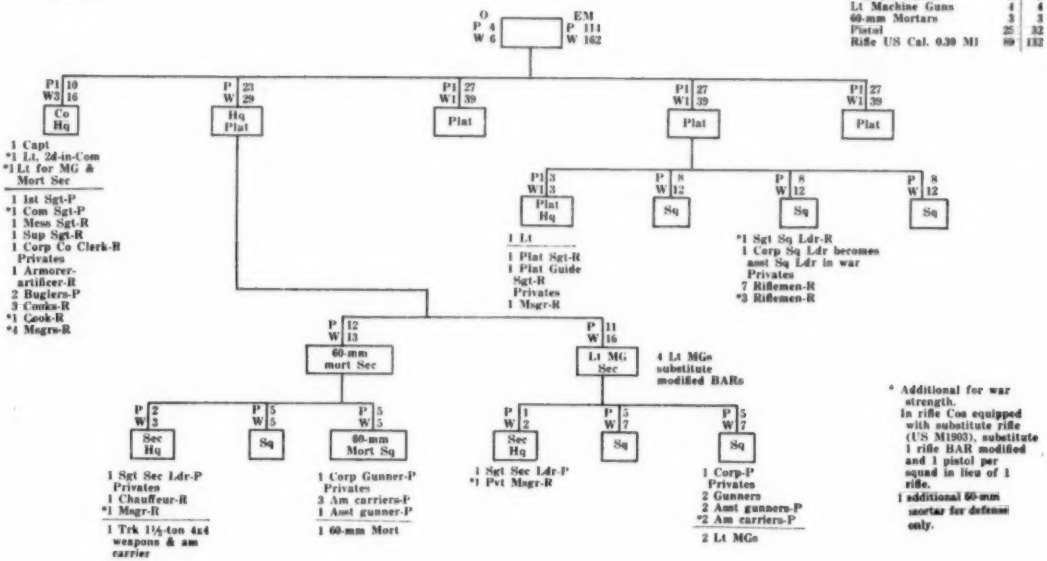


* Additional for war strength.

a Includes 15 enlisted men in the battalion headquarters detachment ammunition section which is inactive and not authorized except when the organization takes the field in time of war at peace strength.

RIFLE COMPANY

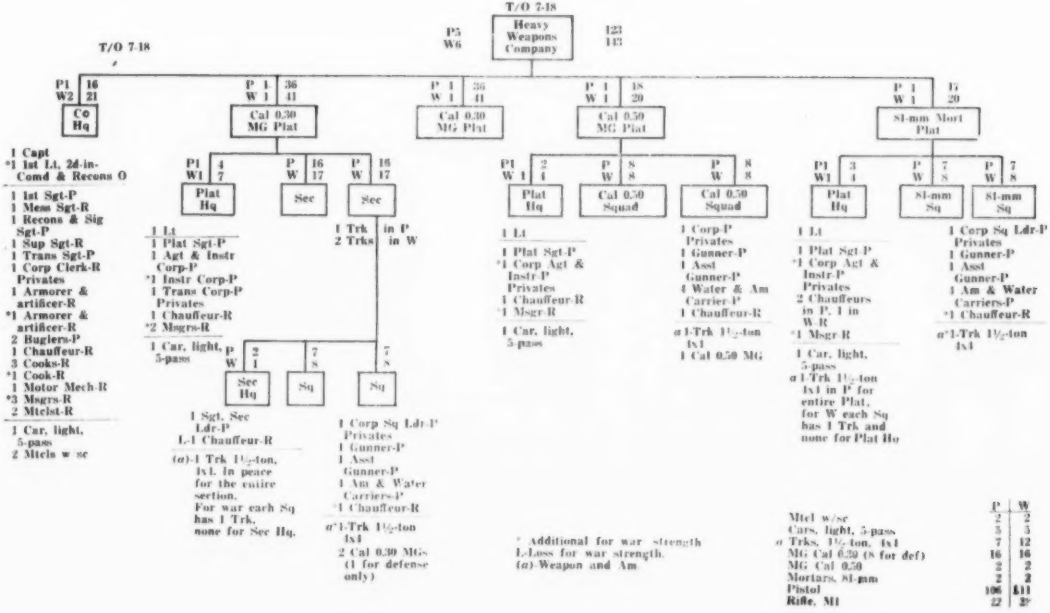
T/O 7-17



	P	W
Trk 1½-ton, weapon & am carrier	1	1
Lt Machine Guns	4	4
60-mm Mortars	3	3
Pistol	25	32
Rifle US Cal. 0.30 M1	89	132

* Additional for war strength.
In rifle Cos equipped with substitute rifle (US M1903), substitute 1 rifle BAR modified and 1 pistol per squad in lieu of 1 rifle.
1 additional 60-mm mortar for defense only.

HEAVY WEAPONS INFANTRY COMPANY (MOTORIZED)

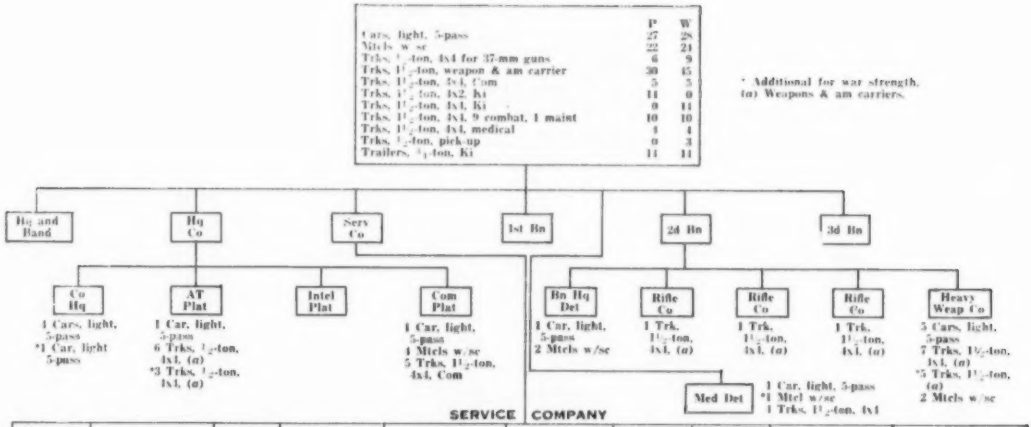


	P	W
Mtcl w/sc	2	2
Cars, light, 5-pass	5	5
a Trks, 1½-ton, 4x4	7	12
MG Cal 0.30 (8 for def)	16	16
MG Cal 0.50	2	2
Mortars, 81-mm	2	2
Pistol	106	111
Rifle, M1	22	27

INFANTRY REGIMENT—TRANSPORTATION

	P	W
Cars, light, 5-pass	27	28
Mtcls w/sc	22	24
Trks, ¼-ton, 4x4 for 37-mm guns	6	9
Trks, 1½-ton, weapon & am carrier	30	45
Trks, 1½-ton, 4x4, Com	5	5
Trks, 1½-ton, 4x2, Ki	11	0
Trks, 1½-ton, 4x4, Ki	0	11
Trks, 1½-ton, 4x4, 9 combat, 1 maint	10	10
Trks, 1½-ton, 4x4, medical	4	4
Trks, ¼-ton, pick-up	0	3
Trailers, ¼-ton, Ki	11	11

* Additional for war strength.
(a) Weapons & am carriers.

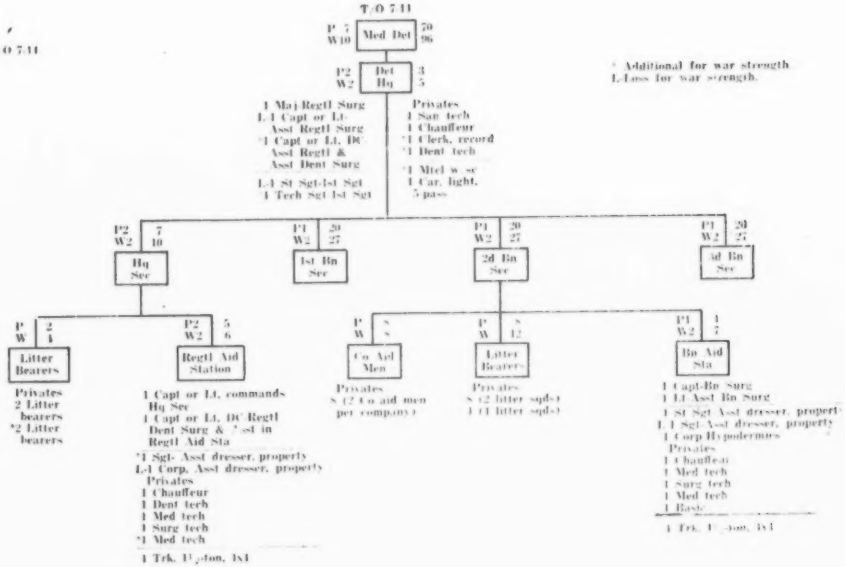


SERVICE COMPANY

Type of train	Co Hq	Staff Sec	Sup Sec	Plat Hq Trans Plat	1st Bn Sec	2d Bn Sec	3d Bn Sec	Hq Co Sec	Maint Sec
Combat					3 Trks, 1½-ton,	Same	Same		
Field	1 Car, Light, 5-pass 1 Mtcl w sc 1 Trk, 1½-ton Ki 1 Trailer, ¼-ton, 2-wheel		1 Mtcl w sc	1 Car, light, 5-pass *1 Mtcl w sc	1 Mtcl w sc 4 Trks, 1½-ton, Ki 4 Trailers, ¼-ton, 2-wheel	Same as 1st Bn	Same as 1st Bn	1 Trk, 1½-ton, Ki 1 Trailer, ¼-ton, 2-wheel	1 Mtcl w sc 1 Trk, 1½-ton Maint (motor) *3 Trks, ¼-ton, pick-up

MEDICAL DETACHMENT, INFANTRY REGIMENT, RIFLE

T/O 7-11



* Additional for war strength.
L-Less for war strength.

CHAPTER 11

Small Infantry Problems

(INFANTRY SCHOOL TEACHING)

PROBLEM No. 1

RIFLE PLATOON—COMBAT PRACTICE

After a rifle company soldier has acquired skill in the use of his weapons—the rifle, light machine gun (automatic rifle, modified), 60-mm mortar, and bayonet—and a knowledge of scouting and patrolling, musketry, and the combat principles of the squad and platoon, he should participate in combat practice exercises which require the application of his knowledge of all these subjects.

Rifle organizations are trained in combat practice by taking small units—squads and platoons (rarely larger units)—into the field and confronting them with tactical situations. The enemy is represented by suitable targets and ball ammunition is used.

The phases of the tactical situation are made as realistic as possible and should require at least a portion of the unit to engage the target with fire. The imagination of the personnel solving the problem must be stimulated so that all concerned will envisage battle conditions and conduct themselves, in so far as safety considerations permit, as though the situation were real.

In preparing a combat practice problem, safety requirements demand that careful consideration be given to the maximum range of the ammunition being used, and the limitations of the terrain. In the usual case the direction of

fire must be restricted. Individuals are not permitted to fire until after their location and intended direction of fire have been checked and approved by an umpire. When firing positions conflict with safety precautions, some men or units are moved from their "battle" positions to other positions from which their fire may be delivered safely. However, aside from restrictions imposed for safety reasons, every effort should be made to allow the unit leaders full freedom of action in the conduct of their tactical maneuvers. Should the platoon leader decide to move a portion of his unit to a location that will improve the tactical dispositions of his platoon, but which, because of safety considerations, it could not occupy without endangering its personnel and from which it could not open fire, the umpire should give the unit due credit for planning the movement.

Exercises of this nature are conducted to best advantge on terrain which is unfamiliar to the personnel of the unit, so that the probable locations of the targets and the ranges to those targets will be unknown. The use of unfamiliar terrain will insure that the route of advance, firing position, and plan of action are not determined in advance.

Combat firing exercises covering the attack, the defense, and the service of security, should be conducted. A simple method of controlling these exercises is somewhat as follows: the umpire, with his assistants, orients the unit on the ground, presents the general situation to the unit leader who then estimates the situation, arrives at a decision and puts that decision into effect as though the situation were real. As the unit proceeds on its mission the enemy, represented by field targets, is encountered. The leader of the unit takes whatever action he considers necessary to meet this new situation. The umpire supervises the execution of the exercise and closely observes the solution worked out on the ground. He is responsible for the observance of all safety precautions.

Throughout the problem the umpire notes the manner in which the principles that have been learned during instruction in marksmanship, musketry, and combat principles

are applied. At the conclusion of the exercise the umpire insures that all weapons are unloaded. He then conducts a short critique. Correct performance is commented upon favorably and errors are pointed out. Personal and hash criticism are avoided.

The problem which follows is an example of a large variety of combat practice problems which may be conducted to test the combat training of platoons and squads. This problem, with minor changes, can be adapted to fit local terrain.

FIRING PROBLEM

PART ONE

MAPS.—Figure 97: Sketch of platoon combat practice problem.

UNIT.—One rifle platoon, consisting of one lieutenant, one platoon sergeant, one platoon guide, one messenger, and three squads of one corporal and seven privates each.

EQUIPMENT.—Field equipment (less rolls). Uniform: Service.

AMMUNITION.—Each rifleman (armed with the M1 rifle) in the three squads—16 rounds caliber 0.30 ball.

Each rifleman (armed with the Springfield rifle) in the three squads—15 rounds caliber 0.30 ball.

For those units armed with the rifle, U.S., caliber 0.30, M1903, there will be one rifle, automatic, Browning, caliber 0.30, modified, per squad. There will be 60 rounds caliber 0.30 ball for each of these weapons, loaded in magazines.

Platoon leader, noncommissioned officers, and messenger —None.

RESTRICTIONS.—Weapons will not be loaded or fired except by authority of an umpire present with the unit. During the movement of the platoon or an element thereof,

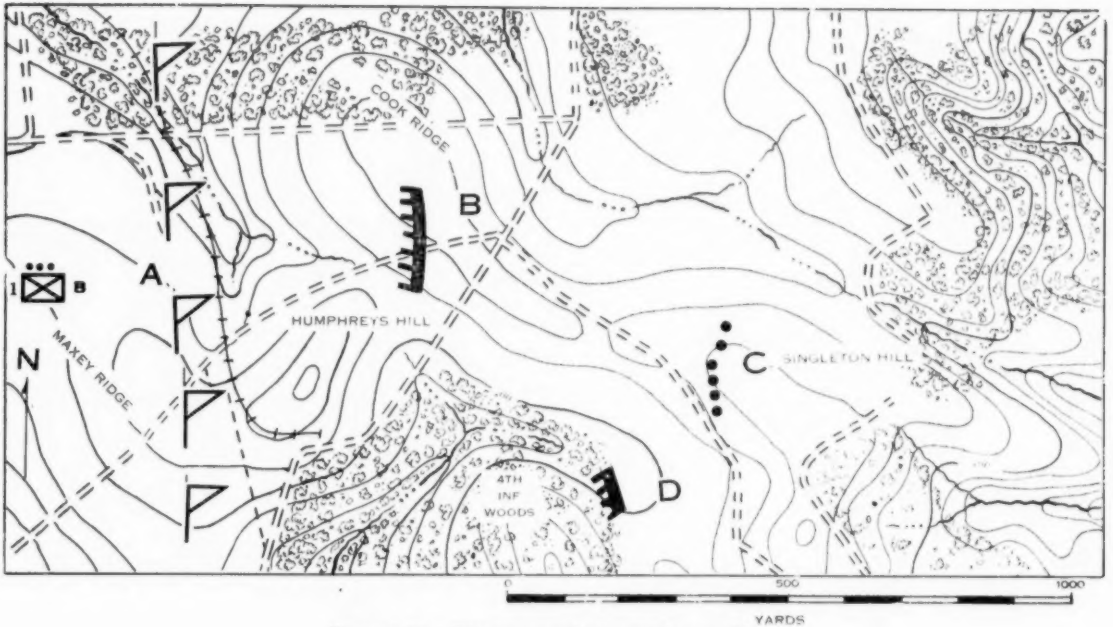


FIGURE 97.—Platoon combat practice problem.

those men who are armed with the Springfield or M1 rifle and are participating in the movement will lock their rifles; those men who are armed with the automatic rifle will withdraw the magazine and have the bolt in the forward position.

Aside from the foregoing restrictions, the unit is allowed full freedon of action in accomplishing its mission.

The umpire will annouce the status of fire superiority from time to time to the platoon leader.

FIRST SITUATION

(Given orally by the umpire to the platoon leader.)

Company B 29th Infantry, a right exterior assault company, has been advancing in an easterly direction with the 2d Platoon in the assault. Company B has halted its advance on the western slopes of Maxey Ridge in order to verify the direction of its advance. The 1st Platoon is now located at the point shown in Figure 97. You are the platoon leader of the 1st Platoon, and have just received the following order from your company commander:

"No contact has been made with the enemy.

"Company A is on our left.

"I will send patrols to protect our right flank and to maintain contact with Company A on the left.

"We resume the advance without delay.

"Formation: Column of platoons, in order: First, Second, Third.

"Direction of advance: 90 degrees magnetic azimuth.

"Your platoon will advance at once; initial formation squad columns echeloned to the right rear.

"Messages to me at head of 2d Platoon.

"Any questions? Move out."

FIRST REQUIREMENT

Actual performance of the platoon in carrying out the orders of the company commander.

SOLUTION

The platoon leader immediately assembles his noncommissioned officers near the crest of Maxey Ridge and briefly gives them the information of the enemy, the supporting units, and the necessary orders to continue the advance. The scouts move out preceding the platoon by 400 to 500 yards. The platoon follows in squad columns echeloned to the right rear. The platoon leader, platoon sergeant, and messenger are between the scouts and the leading squad and the platoon guide follows in rear of the center squad.

SECOND SITUATION

(Given orally by the umpire to the platoon leader when the leading squad (less scouts) reaches a point about 125 yards west of the railroad track on the eastern slope of Maxey Ridge.)

"The area between that line of white flags (pointing) and the railroad track is being shelled by hostile artillery."

SECOND REQUIREMENT

Action of the platoon to meet the situation.

SOLUTION

The platoon leader, noting that there is no cover and that the shelled area cannot be avoided, directs that squad leaders reform their squads in the ditch along the railroad track. Each squad leader decides on the best method of reaching the designated line and moves his unit independently of the other squads. As there is no cover the squad leaders should move their squads across the shelled area by having the men rush forward individually or in small groups.

After assuring himself that his orders are being carried out, the platoon leader signals the platoon sergeant and the messenger to follow him and runs across the shelled area.

The platoon guide insures that there is no straggling and is the last man to move forward.

When the platoon arrives at the ditch the platoon leader promptly regains control of the platoon preparatory to continuing the advance.

THIRD SITUATION

(Given orally by the umpire to the platoon leader when the leading squad (less scouts) crosses the railroad track on the eastern slope of Maxy Ridge.)

"The area betwen this railroad track and that draw, inclusive, (pointing to the draw about 100 yards to the east) is receiving long-range machine-gun fire."

THIRD REQUIREMENT

Action of the platoon to meet the situation.

SOLUTION

The platoon leader directs that squad leaders reform their squads on the slope across the draw. There being no cover available, the squad leaders independently rush their men across the danger area, one or two men at a time.

While the movement is being executed the platoon leader, followed by the platoon sergeant and the messenger, runs across the danger area.

The movement is supervised by the platoon guide. When the platoon arrives at a safe distance across the draw the platoon leader promptly regains control and continues the forward movement in line of squad columns.

FOURTH SITUATION

(Given orally by an assistant umpire to the leading scout when the later reaches a point on the western slope of Cook Ridge from which he can see the targets on Singleton Hill.)

"An enemy group, represented by those targets (pointing) is organizing a defensive position on the slope of that hill. Apparently, the enemy has not seen you."

NOTE

Since the exercise is continuous, the fourth situation above may occur while the platoon leader is involved with the solution of the third situation.

FOURTH REQUIREMENT

The action of the scouts and other elements of the platoon to meet the situation.

SOLUTION

The scouts will immediately hit the ground, seek cover, signal "Enemy in sight", and crawl forward to positions from which they can observe the targets.

The platoon leader signals the squad leaders to join him and moves forward to survey the situation. He issues orders for two squads to engage the enemy from Cook Ridge, and for the remaining squad to move into the 4th Infantry Woods and to attack the enemy's south flank.

The squad leaders of the two leading squads move their squads to the indicated firing positions, designate the targets, and have their squads open fire.

The squad leader of the third squad joins his squad and moves to the right, disappearing into the 4th Infantry Woods. This squad moves to the eastern edge of these woods from which it can open flanking fire on the southern portion of the enemy position. (For safety reasons no firing could be permitted from this position.)

PART TWO

OBJECT.—The objects of this problem are—

a. To teach the application of combat principles in the approach march and in the initial phases of an attack.

b. To teach the combination of fire and maneuver in an attack by a platoon.

c. To teach proper control by the leaders of all units within the platoon.

POINTS FOR COMMENT BY THE UMPIRE DURING THE CRITIQUE.—*a.* Initial reconnaissance by the platoon leader.

b. Initial orders by leaders.

c. Conduct and formations of platoon during the approach march.

d. Conduct of scouts.

e. Action of the platoon leader upon discovery of the enemy.

f. The maneuver employed by the platoon leader.

g. Application of the principle of fire and movement.

h. Use of ground and cover.

i. The application of training in marksmanship and musketry.

j. Aggressiveness.

PREPARATION OF RANGE.—*a. Firing points.*—Base of fire to be established on Cook Ridge, approximately from position shown on Figure 97; direction of fire to the southeast.

b. Targets.—Twelve E targets, in position on the northwestern slopes of Singleton Hill, simulating an enemy group in a hastily occupied defensive position.

c. A row of white flags, parallel to and 100 yards west of the railroad track on the eastern slope of Maxey Ridge.

d. Range guards.—As provided by the range officer.

e. Officials.—One umpire and three assistant umpires.

PROBLEM NO. 2

MACHINE-GUN PLATOON SUPPORTING AN ATTACK

SITUATION

The 1st Battalion 29th Infantry (motorized), an interior unit, is attacking southeast. For boundaries see Figure 98. —Zone of action, 1st Battalion 29th Infantry. Companies A and C are in assault, Company A on the right. The battalion has just captured Rivet Ridge and the 4th Infantry Woods. The units on the flanks are generally abreast of the battalion. The caliber 0.30 machine-gun platoons of Company D are supporting the attack of the battalion from positions on the southern nose of Maxey Ridge and cn Humphreys Hill. The 2d Platoon is in position on the southern nose of Maxey Ridge. The platoon transport is in the woods (Bois Des Tanks) 1,000 yards to the north. After the capture of Rivet Ridge by elements of the 1st Battalion, the platoon leader of the 2d Platoon received the following written message:

"Company A has just captured Rivet Ridge. You will support the further attack of Company A. Move your platoon at once to positions on Rivet Ridge near the southern edge of the 4th Infantry Woods. The 1st Platoon will cover your movement from its present position. My command post will be in the draw at the southwest corner of the 4th Infantry Woods. Captain Company D."

FIRST REQUIREMENT

Actions and orders of Lieutenant 2d Platoon Company D.

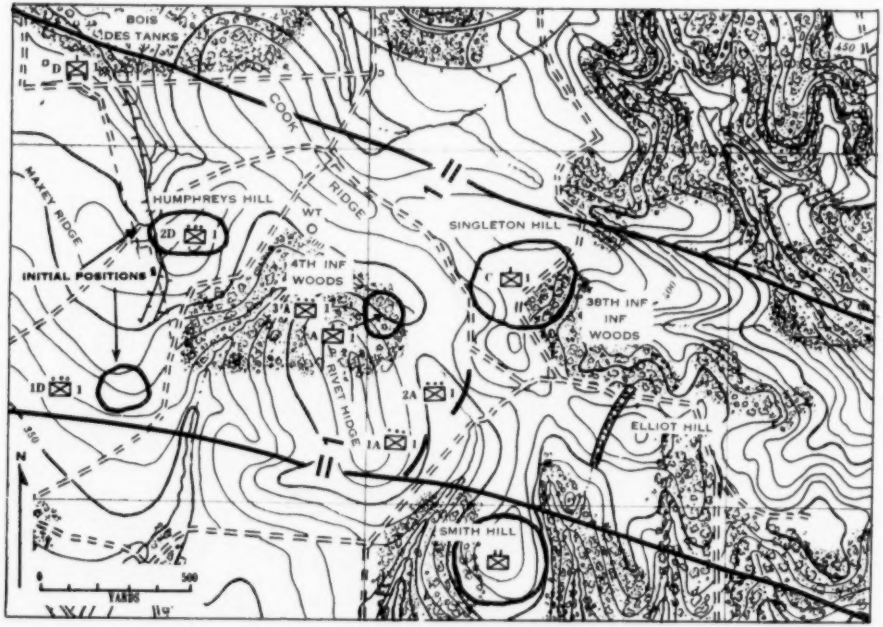


FIGURE 98.—Zone of attack, 1st Battalion 29th Infantry.

A SOLUTION OF FIRST REQUIREMENT

Upon receipt of the message to move forward to Rivet Ridge, Lieutenant 2d Platoon signals, "Leaders join me" and while waiting for the leaders to arrive he calls the agent corporal and instrument corporal to him. When the platoon sergeant and the two section leaders arrive he issues the following orders:

"Company A has just taken that ridge—pointing to Rivet Ridge—to our front. This platoon will support the further attack of Company A. I am going forward to that ridge at once. Platoon sergeant bring the entire platoon forward. Equipment will be moved by hand. Formation: Line of section columns. Stop near that mound (pointing). Section leaders report to me near the crest of the ridge. Instrument corporal, agent corporal, and messenger come with me. Any questions? Move out."

DISCUSSION

The 2d Platoon has been ordered to displace forward as a unit; its movement will be covered by the 1st Platoon from its position on Humphreys Hill.

In order to save time and also acquaint everyone concerned with what is happening, the platoon leader assembled the "key" men of the platoon and then issued his orders.

The platoon leader arranged to precede his platoon to the new position. He did this in order to have time to reconnoiter and obtain the information necessary to place the platoon in position when it arrives. The platoon leader would like to issue orders to the section leaders on their arrival, so he designated a definite place for the section leaders to report for orders. To insure that the platoon moves to the desired spot on Rivet Ridge, he pointed out to the platoon sergeant a definite terrain feature, to which the platoon sergeant could guide the platoon unhesitatingly. The formation ordered for the advance will prevent the platoon from bunching up and offering a good target to the enemy.

SECOND SITUATION

The 2d Platoon Company D is now en route to Rivet Ridge. Lieutenant 2d Platoon, together with the instrument corporal, agent corporal, and one messenger, arrives on Rivet Ridge where he meets Captain Company A who gives him the following information:

"The enemy holds that big hill to our front (pointing to Elliot Hill). The battalion on our right has taken that hill (pointing to Smith Hill). Company C has taken that hill (pointing to Singleton Hill). My assault rifle platoons are in the draw just in front of us—one near the right boundary; the other 200 yards northeast of it near where the unimproved road crosses that stream bed. My 3d Platoon is near the eastern edge of that woods (pointing to the 4th Infantry Woods). I am going to outflank that hill to our front (Elliot Hill) by sending the 3d Platoon across the saddle on Singleton Hill, thence through those woods (pointing to the 38th Infantry Woods). I want you to cover the advance of the 3d Platoon by firing on the enemy's position on Elliot Hill. Open fire as soon as you are in position. The platoon will advance when you open fire. My command post will be just west of the crest of this ridge near the southern boundary of those woods (pointing to the 4th Infantry Woods). Any questions?"

SECOND REQUIREMENT

Actions and orders of Lieutenant 2d Platoon Company D from the time he receives the information from Captain Company A until the platoon opens fire on the enemy position on Elliot Hill.

Actions and orders of the section leaders from the time they meet the platoon leader near the crest of Rivet Ridge until their sections open fire on the enemy position on Elliot Hill.

A SOLUTION OF SECOND REQUIREMENT

Actions and orders of Lieutenant 2d Platoon.—After receiving the information from Captain Company A, Lieutenant 2d Platoon directs the instrument corporal as follows:

"Obtain the range to that hill (Elliot Hill)."

He directs the agent corporal to remain near the crest of the ridge. He then crawls forward and reconnoiters for targets and gun positions, accompanied by the messenger. He tests to determine the safety limits for overhead fire at each tentative position chosen. On return from his reconnaissance he obtains from the instrument corporal the range to Elliot Hill, 750 yards. He notices with satisfaction that the platoon sergeant is bringing the platoon forward. He signals the two section leaders to join him. When they arrive he issues to them and the agent corporal the following order:

"The enemy holds that hill to our front (pointing to Elliot Hill). The battalion on our right has taken that hill (pointing to Smith Hill). Company C has taken that hill (pointing to Singleton Hill). The assault platoons of Company A are in the draw just in front of us. The 3d Platoon is in that woods (pointing to the 4th Infantry Woods). It is going to move across the saddle on Singleton Hill and through the woods beyond (38th Infantry Woods) and outflank the enemy position on Elliott Hill from the left (north).

"We will support the attack by firing on the enemy on that hill (Elliot Hill).

"The 1st Section will take position there (pointing to a part of Rivet Ridge 100 yards south of the woods) and cover that part of the enemy position from the large bare spot near the center of the hill, right 80 mils to that group of scrub trees. Range 750. Overhead. Safety limit those bushes on the far side of the draw. Medium. Notify me when ready. I will give the signal to open fire. Section leader 2d Section come with me."

Lieutenant 2d Platoon then conducts the 2d Section leader to his area which is to the left of the 1st Section near the southern edge of the 4th Infantry Woods, and issues the order for the 2d Section. This order is similar to the one for the 1st Section except that the unit is ordered to cover that part of the enemy position from the center of the hill to a point 80 mils to the left.

He then meets the platoon sergeant who has been busy supervising going "off carts" and explains to him the orders that he has given to the section leaders and issues the following instructions:

"Establish the platoon command post about 75 yards west of the crest of this ridge near the southern boundary of those woods (4th Infantry Woods). Be sure that the ammunition chain carrying the ammunition from the transport in the Bois Des Tanks is working OK."

He then directs the agent corporal as follows:

"Report with Brown (messenger) to Captain Company A who is near the southeast corner of those woods (pointing to 4th Infantry Woods). Keep me informed as to the situation in the rifle company and the captain's desires for fire support. My CP will be near the crest of Rivet Ridge in the south edge of those woods (pointing to the 4th Infantry Woods)."

He then directs the messenger from Headquarters Company D (the one who brought the message to move to Rivet Ridge and who has stayed with the platoon as it moved forward) as follows:

"Go back to the CP of Company D which is in that draw (pointing to the southwest corner of the 4th Infantry Woods) and notify Captain Company D that we are in position here."

Messengers from Company Headquarters bringing orders for a change in location are retained with the platoon until the new position is occupied. Then they are returned to the CP of the Company with definite information as to the location of the platoon.

The platoon leader studies the target, checks on the range, and assures himself that both sections are going into the

prescribed positions. As soon as both section leaders signal that their sections are ready the platoon leader gives the signal to commence firing.

Actions and orders of the section leaders.—When the section leaders receive their orders for the attack they signal to their squad leaders to join them. (The platoon sergeant had halted the platoon about 150 yards below the crest of Rivet Ridge.) They then make a quick reconnaissance of the areas assigned their sections and determine more definitely the area each squad will occupy. When the squad leaders arrive the section leaders issue orders to them as follows: Order for 1st Section—

"The enemy occupies that hill (pointing to Elliot Hill). The assault platoons of Company A are in the draw in front of us. The reserve platoon of Company A will pass through those woods (pointing to the 38th Infantry Woods) and outflank Elliot Hill. We will support the movement of that platoon by firing on that hill (pointing to Elliot Hill). Range 750. Mount your guns so as to be able to fire from that bare spot on top of the hill right 80 mils. No. 1 gun there (pointing to its location), No. 2 gun there (pointing to a location about 25 yards north of the No. 1 gun). Signal me when you are in position. Fire order later."

The order for the 2d Section is similar to the one for the 1st Section except for the location of the gun positions and the fact that it directs the squads to fire on the left half of Elliot Hill.

As soon as the section order is completed, each squad leader reconnoiters for the exact position the squad is to occupy and then signals the squad forward. When the squad arrives the corporal designates the exact gun position, the direction of fire and the range, and directs the gunner to mount the gun. The squad then occupies the position, the men crawling in order to take advantage of all available cover.

When the guns are in position each section leader issues a fire order to his section. Fire order for the 1st Section:

"Range 750.
Front, that hill.
Reference, center of hill, large bare spot.
Target, skirmish line extending right 80 mils.
Traverse.
Overhead.
Troops in draw to front.
Safety limit those bushes on the far side of the draw.
Medium.
Upon signal."

The fire order for the 2d Section is similar to the one for the 1st Section except that it directs the squads to fire on the left side of Elliot Hill.

When the fire order has been issued and both guns of the section are ready to fire each section leader signals the platoon leader that his section is ready. When both sections have reported and the platoon leader signals, "Commence firing," the section leaders repeat the signal and both sections open fire on Elliot Hill.

DISCUSSION

Actions and orders of Lieutenant 2d Platoon.—Before Lieutenant 2d Platoon can determine where to place his guns he has to know where Company A is located, what Captain Company A plans to do, and what supporting fires he wants from the machine guns. As soon as he knows these things Lieutenant 2d Platoon can definitely determine the areas that should be covered by fire, and select positions for the guns of his platoon. He selects positions that are on high or commanding ground if possible. These positions should have good fields of fire and afford some cover and concealment. He gives each section leader his order on the ground that the section is to occupy. In this situation there is a small gap between the two assault platoons of Company A but for safety reasons Lieutenant 2d Platoon decides to have all guns fire in accordance with the rules for

overhead fire. Owing to the height of Rivet Ridge it is safe to fire over the heads of the assault platoons of Company A although they are only about 200 yards in front of the guns. To make sure that the fire will be a surprise to the enemy he states that he personally will give the signal to commence firing. It will be better to have all four guns of the platoon open fire at the same time rather than each gun, or section, by itself. The initial volume of fire will be greater and the enemy will have less chance to protect himself. He acquaints the platoon sergeant with all of the instructions that have been given so that if the platoon leader should become a casualty the platoon sergeant can lead the platoon intelligently.

He sends the agent corporal and one messenger to the rifle company command post to maintain liaison with that organization. The platoon order is issued in the presence of the agent corporal so that when he goes to Company A he can tell the rifle company commander exactly what is being done to support the attack.

He sends the other messenger back to his own company commander to give him the information that the platoon has moved and is now ready to fire. By holding the messenger until this time he makes sure that the messenger knows the exact location of the platoon.

Actions and orders of the section leaders.—The section leaders make a reconnaissance of their areas before issuing their orders. They check on their squads as they move forward into position and assist in making the men take advantage of cover. The section leaders are responsible that the guns of their sections are able to fire on the target designated by the platoon leader and that the guns are located so as to take full advantage of all possible cover and concealment.

PROBLEM NO. 3

TANK UNITS SUPPORT AN INFANTRY REGIMENT

SITUATION

The 2d Infantry is an interior regiment of a larger force, which is attacking in a northeast direction. The 1st Battalion 2d Infantry is now holding the regimental front line. For regimental and battalion boundaries, line of departure, and partial organization of the enemy position see Figures 99 and 100.

The 1st Battalion 901st Infantry (Light Tanks), reinforced with the 3d Battalion 911th Infantry (Medium Tanks) (less Company I), the 1st Platoon Maintenance Company 901st Infantry (Light Tanks), and the 3d Platoon Maintenance Company 911th Infantry (Medium Tanks), was attached to the 2d Infantry at 2:40 PM, 24 March 1939.

At 2:50 PM Lieutenant Colonel 901st Infantry (Light Tanks) with certain members of his staff and a detachment of the headquarters company reported to Colonel 2d Infantry, who informed him of the situation and the plan of the 2d Infantry for the attack on 25 March.

Extracts of the plan follow:

The 2d Infantry, with attached units, to attack with the 2d and 3d Battalions in assault, 2d Battalion on the right. Boundaries as shown on Situation Sketch.

The 3d Battalion, with Company C 2d Infantry attached, assisted by the 2d Battalion, to capture Oak Ridge and continue its advance in the direction of hill 662-a and the high ground near C. Adams.

The 2d Battalion, making its principal effort initially on its left, to assist the 3d Battalion in the capture of Oak Ridge, and continue its advance in the direction of hill 565.

The 1st Battalion (less Company C), when passed through, to assemble in regimental reserve in woods south of RJ 533-H.

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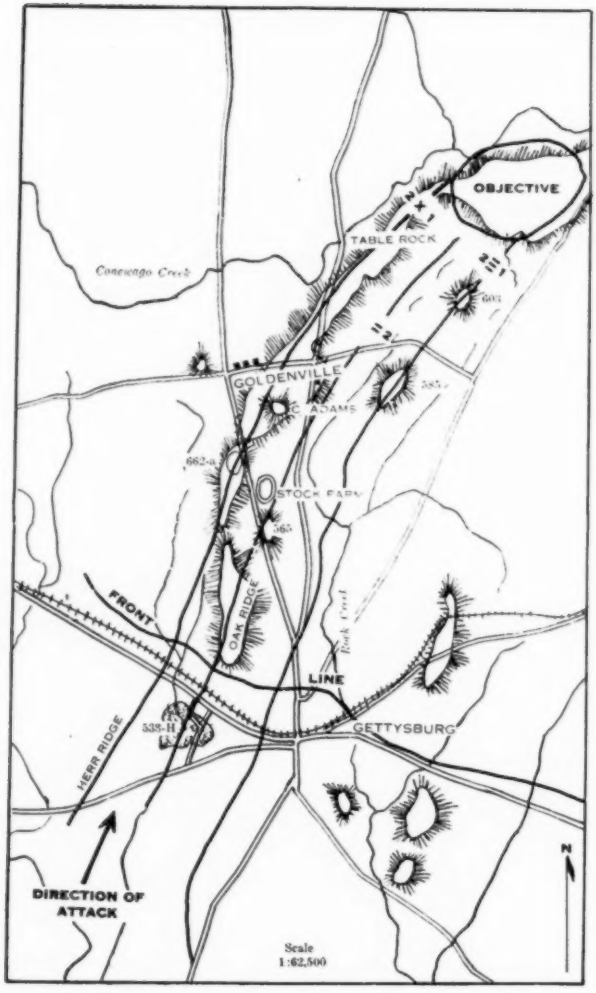

FIGURE 99.—Situation Sketch, 2d Infantry.

Colonel 2d Infantry has directed you, as Lieutenant Colonel 1st Battalion 901st Infantry (Light Tanks) to complete your reconnaissances and submit your recommendations for the employment of your reinforced battalion at 3:45 PM, 24 March.

FIRST REQUIREMENT

The recommendations of Lieutenant Colonel 1st Battalion 901st Infantry (Light Tanks) to Colonel 2d Infantry as to the allotment, if any, of his tank units to:

(1) 2d Battalion.
(2) 3d Battalion.
(3) 2d Infantry for an attack under regimental control.
(4) Reserve.

A SOLUTION OF FIRST REQUIREMENT

Lieutenant Colonel 1st Battalion 901st Infantry (Light Tanks) recommends to Colonel 2d Infantry that his tank battalion, reinforced, attack as a unit under regimental control.

DISCUSSION

The main attack of the regiment is to be in the zone of action of the 3d Battalion. Hence the bulk of the tank strength should be employed initially in the terrain corridor formed by Oak Ridge and the ridge along the west boundary of the 3d Battalion. Any tank attack on the eastern slopes of Oak Ridge is open to direct hostile artillery fire from batteries located on the eastern slopes of the valley of Rock Creek and to antitank gun fire from guns located principally on the western slopes of the valley.

While the tank attack should cover as broad a front as is consistent with other factors, in this situation it is believed that the entire mass of tanks should strike the enemy position along its front between the ridge 300 yards east of RJ 571-C and the west boundary of the regiment.

In attacking the enemy position on Oak Ridge, the tanks operate initially in the zone of action of both the 2d and 3d Battalions. The regimental commander is better able to coordinate the supporting artillery and chemical fires than can the two battalion commanders. He can arrange more easily for cooperative mortar and machine-gun fire support between the assault battalions, the reserve battalion, and the tank elements. Hence, in this situation, it is considered best to employ the tank units under regimental control.

Further, it appears that, in the latter stages of the attack the tank units will likely be employed in the zone of action of the 3d Battalion against the high ground in the vicinity of the Stock Farm and hill 662-a; and that the advance from this objective to the final objective will be made up a natural terrain corridor corresponding to the zone of action of the regiment. (See Figure 99.)

No reserve of tanks was held out by the 2d Infantry. The tank battalion, reinforced, should attack successive objectives with its full power and, with only reasonable casualties, should have left a sufficient number of tanks to attack the final objective.

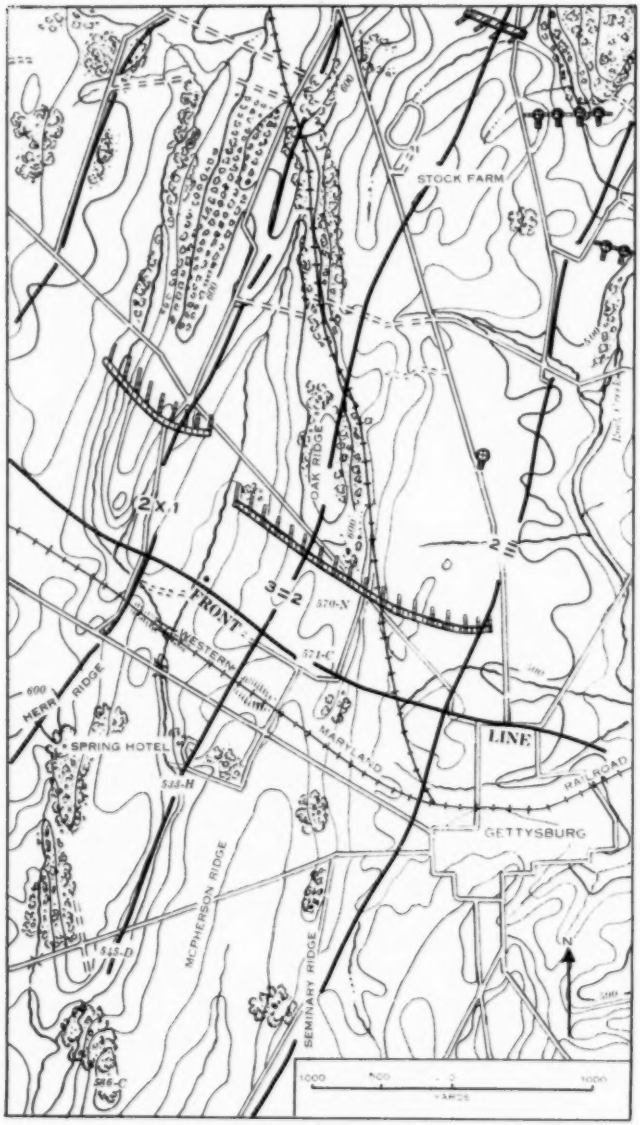

FIGURE 100.—Terrain in area of 2d Infantry.

SITUATION, CONTINUED

The tank battalion, reinforced, has been ordered to attack on 25 March under regimental control. Colonel 2d Infantry has called upon Lieutenant Colonel 1st Battalion 901st Infantry (Light Tanks) to submit his recommendations for the employment of his tank battalion reinforced against the initial tank objctive: the hostile positions on Oak Ridge west of RJ 570-N—eastern slopes of ridge along the regimental west boundary.

SECOND REQUIREMENT

The recommendations of Lieutenant Colonel 1st Battalion 901st Infantry (Light Tanks) to Colonel 2d Infantry for the employment of his tank unit against the initial tank objective to include only:

(1) The selection of assault position (s).
(2) The selection of assembly point (s).
(3) The selection of alternate assembly point (s).

A SOLUTION OF SECOND REQUIREMENT

Lieutenant Colonel 1st Battalion 901st Infantry (Light Tanks) recommends to Colonel 2d Infantry that the following sites be selected for the attack against the initial tank objective:

(1) Assault positions:

(a) For the 1st Battalion 901st Infantry (Light Tanks) (less Company C) and for Company H 911th Infantry (Medium Tanks): the woods on the west slopes of McPherson Ridge north of the road running through RJ 533-H.

(b) For the 3d Battalion 911th Infantry (Medium Tanks) (less Companies H and I) and for Company C 901st Infantry (Light Tanks): the woods north and west of Spring Hotel.

(2) Assembly points: the assault positions.

(3) Alternate assembly points:

(a) Woods north of hill 586-c for units in (a) above.

(b) Woods northwest of CR 545-D for units in (b) above.

DISCUSSION

The assault positions that were chosen are suitable for the attack, even though crossings will probably have to be prepared for tanks to cross the tracks of the Western Maryland Railroad. A study of the map shows a series of cuts and fills along the railroad line covering nearly the entire corridor between the southern nose of Oak Ridge and the ridge near the western boundary of the regiment. The assault positions offer excellent cover and concealment. Although the positions are close to the line of departure, it is believed that the tanks can move into them at reduced speed without being seen or heard. Two positions were selected as there are five combat companies operating on this narrow front and it is believed that to select only one assault position would have resulted in overcrowding. The assault position for a tank battalion should measure approximately 600 by 600 yards. No one position offering

both cover and concealment for such a unit exists in this area. Dispersion will also help to prevent losses should the enemy place artillery fire on the assault position. Two light tank companies and a medium tank company were assigned the right assault position with a battalion headquarters included. The organized enemy position extending 1,100 yards west from RJ 570-N should offer more resistance than should be encountered near the western boundary of the regiment and the larger number of tank units was assigned the task of neutralizing that resistance. One light tank company, one medium tank company, and a battalion headquarters was assigned the left assault position. Since the medium tanks precede the light tanks in the attack, medium and light tanks were assigned to each assault position to obviate flanking and oblique movement of tanks forward of the assault positions.

No suitable assembly point in the zone of action of the regiment exists north of the assault positions. As a consequence the assault positions were selected as assembly points for their respective units.

Alternate assembly points were selected as indicated. While satisfactory, the alternate assembly point in the woods north of hill 586-c is not as suitable as the right alternate assembly point due to part of it being on a forward slope and on high ground.